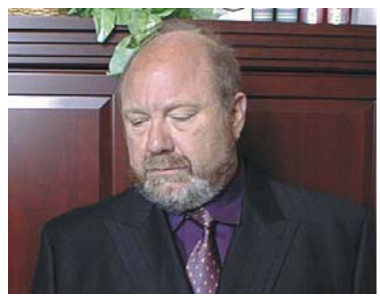
HANDS-ON

Swodeam Consulting
www.swodeam.com

FIRST ISSUE: WELCOME

Welcome to the first edition of Hands On the newsletter of Swodeam Consulting. In this newsletter we shall try to give you information on subjects relevant to the manual therapist. This will include evidence based and speculative information, various models on clinical practice and, unfortunately, the politics of physical therapy. I am Jim Meadows, who is, until somebody more qualified but silly enough to take on the job, the editor of the Hands-On. I was born and trained in the UK, lived and worked in Norway, spent most of my professional life in Canada and now reside in Mexico and while the flag on the logo is that of Canada, I consider myself to be part of a larger community and will be happy to deal with issues that are topical in any country. I promise you that the photograph on this page is the last close up you will see of me, unless I need to fill up space so be warned, it's up to you.



As always the newsletter will carry items that are written for it and if I am left to do it you can expect to see a lot of ads for Swodeam's products (and more photographs of me), if you send in articles, items of interest , etc. there will be less room for my stuff and we will all be happier. Hands-On is happy to print your comments, questions and articles but reserves the right to not print them as well if the editor so chooses. If you would like to advertise a course or product and I do not find it irrelevant to the subject at hand, offensive or directly competitive with my products I would be happy to have it in the newsletter at no financial charge (which means you may owe something non-financial to Hands-On).

Finally Hands-On will be as long as you want it to be, at a minimum it will consist of ads for my products at a maximum it will contain everything you send in, but I intend to have at least

Courses in the Next Month

Sep 10-12	The Acute MVA Patient	Tacoma, WA
Sep 17-19	The Acute MVA Patient	Everett, WA
Sep 24-26	The Chronic MVA Patient	Ottawa, ON
Oct 1-3	The Chronic MVA Patient	Edmonton, AB
Oct 8-10	Lumbar Thrust	San Diego, CA

For further information on courses contact jim@swodeam.com

Volume 1, Issue 1

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Inside this issue:

Swodeam Courses 2004

2004	Course	Location
Jan 9-11	L2 Lower (A)	St Louis, MO
Jan 16-18	L2 Lower (B)	St Louis, MO
Jan 23-24	L2 Upper (A)	Houston, TX
Feb 6-9	L2 Upper (A)	Houston, TX
Feb 13-15	The Acute MVA Patient	Washington, DC
Feb 20-22	Lower Limb	Baltimore
Feb 27-29	L 3 Upper (A)	Madison, WI
Mar 2-4	Clinical Practice	Dallas, TX
Mar 5-7	L3 Upper (A)	Dallas, TX
Mar 12-14	Peripheral Manipulation	Colorado Springs, CO
Mar 19-21	L3 Upper (B)	Milwaukee, WI
Mar 26-28	L3 Upper (A)	Quebec City, PQ
Apr 2-4	L3 Upper (B)	Quebec City, PQ
Apr 16-18	L3 Upper (B)	Dallas, TX
Apr 23-25	The Chronic MVA Patient	Ithaca, NY
Apr30-May 3	Spinal Manipulation (A)	Boston (MA)
May 7-9	Spinal Manipulation (A)	Fremont, CA
May 14-16	Spinal Manipulation (B)	Fremont, CA
May 21-23	L2 Lower (A)	Portland, OR
May 29-31	Acute MVA	Quebec
Jun 4-6	Peripheral Manipulation	Ottawa, ON
Jun 11-13	Spinal Manipulation(C)	Fremont, CA
Jun 25-27	Spinal Manipulation (B)	Boston, MA
Jul 16-18	L3 Upper (A)	St Louis, MO
Aug 13-15	L3 Upper (B)	St Louis, MO
Sep 10-12	The Acute MVA Patient	Tacoma, WA
Sep 17-19	The Acute MVA Patient	Everett, WA
Sep 24-26	The Chronic MVA Patient	Ottawa, ON
Oct 1-3	The Chronic MVA Patient	Edmonton, AB
Oct 8-10	Lumbar Thrust	San Diego, CA
Oct 15-17	L3 Lower (Lower Quad)	Quebec City, PQ
Oct 22-24	L3 Lower (Lower Quad) 2	Quebec City, PQ
Oct 29-31	L3 Lower (A)	Detroit, MI
Nov 1-4	Clinical Placement	Detroit, MI
Nov 5-7	L3 Lower (A)	Detroit, MI
Nov 12-14	The Acute MVA	Boise, ID
Nov 26-28	Chronic MVA	Saskatoon, SK
Dec 10-12	Cervical Spine	Baltimore

All courses unless specifically stated are combinations of lecture and lab, usually about 50/50. Each course is organized by a local coordinator and for contact to that person please email Jim Meadows at jim@swodeam.com

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For further information on courses contact

Alar Ligament Injuries. Part 1: The Science

Jim Meadows

This is a synpopsis of a study on alar ligament tearing in motor vehicle accidents. The study was carried out by Krakenes, J. et al. MRI assessment of the alar ligaments in the late stages of whiplash injury – study of structural abnormalities and observer agreement. Neuroradiol. 44:617-624, 2002)[5].

Anatomy

The alars are paired ligaments running from the upper two-thirds of the dens to the area just medial to the occipital condyles and in about 60% of the specimens observed in one study, there was an attachment between the dens and the atlas. The orientation was dependent on the size of the dens and was mainly cranio-caudal[3]. The ligaments average length is a little over 10mm with an average orientation of 70 degrees to the sagittal plane but with considerable variations[7].

The ligaments are predominantly collage and the cross –section of the ligament changes as it nears the dens.

Krakenes found

"The alar ligaments were clearly seen in every case and had three different configurations in cross-section: round, ovoid or wing-like. A broadening from lateral to medial in the coronal plane was observed in all cases." [6]

The dento-occipital portion of the alar ligament tightens with contralateral rotation and contralateral side flexion. They have a tensile strength of 250N (about 45lbs) while the transverse ligament's is 350N lbs (about 63). The lower tensile strength and the more physiological orientation permits rupture of these ligaments with moderate forces whereas the dens fractures before the transverse ligament tears[4].

Injury

The ligaments have been believed to tear with trauma and relatively recently in vitro and in vivo studies have demonstrated that moderate forces such as whiplash are capable of rupturing them either completely or incompletely[1,5,8].

The Krakenes study is among the more recent on the alar ligaments and was intended:

Purpose of the Krakenes study was to:

- to diagnose alar ligament injury
- to introduce a new protocol for the MRI investigation of the integrity of the alar ligament

- to investigate the reliability of the MRI in diagnosing alar ligament injury
- to investigate the reasons for divergence in reading the MRI

Inclusion Criteria

- diagnosed as having a whiplash injury by local physician
- grade 2 injury (QTF classification) at time of inclusion and 12-16 weeks later

Exclusion Criteria

- grade 1, 3 or 4 injuries (QTF classification)
- abnormal plain films at time of consideration for inclusion

Sample

Of the original 324 appropriate subjects, a random sample of 100 were invited to join the study. Seven declined or failed to respond to the invite and one claustrophobic could not tolerate the MRI unit. The remaining 92 were followed prospectively and compared with a matched control group of 30 people with no history of head or neck trauma.

Descriptive Statistics

Subject Group Control Group

N = 92	N = 30
Mean age = 40 years range 14-61	Mean age = 46 years range 28-66
33 males and 59 females	11 males and 19 females

Mean time to MRI = 6 years range 2-9 years

Methodology

Various views, weights and other technical stuff obviously important to radiologist but of amazingly little interest to physical therapist was used to image the ligaments. The images from the subject and control groups were then randomly mixed (shuffled) and read by three different radiologists. The images were then re-read by the same radiologists four months later. Those ligaments graded differently either by the same radiologist on different occasions or by different radiologists were reassessed to ascertain the reasons for the difference.

Experimental Statistics

For those in the know, Kappa coefficients for evaluating intra-observer agreement and pair-wise for interobserver agreement were used. Ordinary kappa coefficients were calculated for all four possible MRI gradings (0-3) and pairs of grades (0-1 versus 2-3). Weighted kappa was used to determine the amount of disagreement. Consistent differences in grading were evaluated using the McNemar's test for symmetry. OK!

Results

The injuries were visualized with coronal and sagittal views but not with axial, this showed orientation rather than structure. There were 244 studies among the 122 study and control subjects. The grading of 214 ligaments were agreed by all or the majority of the readers (87.7%).

- Grade 1-3 injuries comprised 92% of the total ligaments in the study group
- The Grade 1 injuries comprised 41% of the total ligaments in the study group
- The Grade 2 and 3 injuries comprised 28% of the total ligaments in the study group
- As there were cases where both ligaments were injured in the same patient 49% of the study group suffered Grade 2 or 3 injures
- 29% Grade 2
- 20% Grade 3
- 42 ligaments were classified as Grade 1. The control group were found to have 4 cases of Grade 1 ligament injury with no grade 2 or 3 injuries in the control group leading the investigators to conclude that grade 2 and 3 injuries found in the study group were the result of whiplash.
- 29 ligaments were classified as Grade 2 (none in the control).
- 23 ligaments were classified as Grade 3 (none in the control).
- 87% of the total of 94 Grade 1-3 injuries were found at the condylar attachment
- 13% of the total of 94 Grade 1-3 injuries were found at the dens attachment
- 0% of the total of 94 Grade 1-3 injuries were found in the body of the ligament

There was no correlation found between the MRI diagnosis of alar ligament injury and rotational or lateral shift of the atlas on plain X-rays.

Optimal visualization of ligament damage was found to occur with:

- A slice thickness of 2 mm
- A proton-density weighted sequence
- Coronal and sagittal views (not axial)

Conclusion

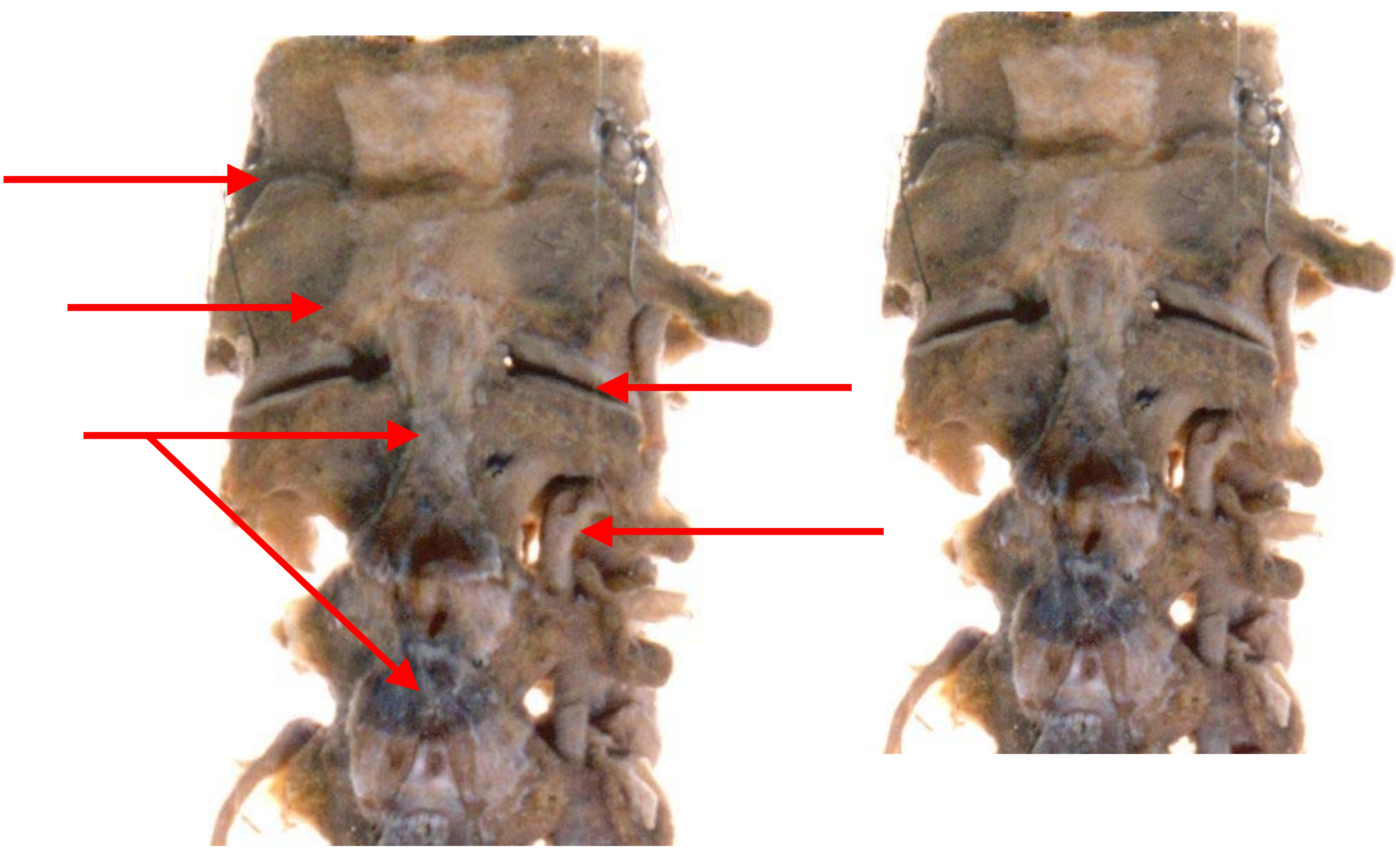
Alar ligament injury is a relatively common occurrence in post-whiplash victims with frequently both ligaments being injured. The numbers of the grade 1 injury might be exaggerated by non-whiplash causes but the grade 2 and 3 injuries seem to be the result of whiplash. The injury can be visualized by appropriate MRI technique but will be missed if the technique is inappropriate.

Insufficiency of the alar ligament will produce and increase the average contralateral rotation at the atlanto-axial joint by up to 30% or almost 11 degrees[3]. Hypermobility of this region either due to alar ligament, odontoid process or transverse ligament insufficiency has been shown to be a factor in the production of vertigo and associated symptoms possibly by occlusion of the vertebral artery or by disturbance of afferent input to the vestibular nuclei.

Partial or complete tears of the alar ligament, generally, are not an immediate serious danger to the patient's life and a less drastic approach can be taken. Treatment can be continued but should not be such that it might transform a grade 2 to a grade 3 tear or exacerbate symptoms ascribable to damage to this ligament. The physician should be informed and MRIs[1,5,6] or as second choice CTs[2,3] should be ordered or where these are not easily accessed, side flexion and rotation X-rays of the cranio-vertebral joint may demonstrate the instability[2].

1. Antinnes JA, Dvorak J, Hayek J, et al. The value of functional computed tomography in the evaluation of soft-tissue injury in the upper cervical spine. Eur Spine J 1994;3:98-101.
2. Dvorak J, Panjabi M, Gerber M, et al. CT-functional diagnostics of the rotatory instability of upper cervical spine. 1. An experimental study on cadavers. Spine 1987;12:197-205.
3. Dvorak J, Panjabi MM. Functional anatomy of the alar ligaments. Spine 1987;12:183-9.
4. Dvorak J, Schneider E, Saldinger P, et al. Biomechanics of the craniocervical region: the alar and transverse ligaments. J Orthop Res 1988;6:452-61.
5. Krakenes J, Kaale BR, Moen G, et al. MRI assessment of the alar ligaments in the late stage of whiplash injury--a study of structural abnormalities and observer agreement. Neuroradiology 2002;44:617-24.
6. Krakenes J, Kaale BR, Rorvik J, et al. MRI assessment of normal ligamentous structures in the craniovertebral junction. Neuroradiology 2001;43:1089-97.
7. Panjabi MM, Oxland TR, Parks EH. Quantitative anatomy of cervical spine ligaments. Part I. Upper cervical spine. J Spinal Disord 1991;4:270-6.
8. Urso S, Pacciani E, Ascani E, et al. [Static-dynamic computerized tomography in the diagnosis of traumatic lesions of alar ligaments. Preliminary results]. Radiol Med (Torino) 1994;88:736-41.

Name the structure inidcated by the arrows



Quizzes for Fun
Answers Next Month

WORD JUMBLE

In the box are at least 11 words (there may be more, I've never been good at these things) related to physical therapy, either anatomy, pathology, treatment etc. Find them.

M	F	S	I	S	H	U	N	S	S
O	E	S	O	P	H	A	G	U	S
S	S	E	I	P	V	W	G	R	O
O	F	D	I	I	T	V	L	T	U
B	U	R	N	S	C	O	I	O	N
E	L	I	I	I	C	R	P	T	D
R	T	C	O	F	F	U	S	H	B
B	R	O	N	O	S	E	S	I	Y
E	A	C	A	R	P	A	L	G	W
L	F	T	A	M	C	A	D	H	Y

Answer the following:

1. The vertebral artery is in four parts names from inferior to superior as:

A. Osteal, transverse, intracranial, sub-occiptial
B. Transverse, sub-occipital, osteal, intracranial
C. Osteal, transverse, sub-occipital, intracranial
D. Primus, secondus, tertius, quartus

2. From medial to lateral the brachial plexus is divided into:

A. Roots, spinal nerve, division, trunk, cord, branches
B. Spinal nerve, roots, trunk, division, cord, branches
C. Roots, spinal nerve, cord, trunk, division, branches
D. Roots, spinal nerve, trunk, cord, division, branches

Which of the following definitions for S1 nerve root pain is best::

A. Any pain that runs down the back of the leg in the S1 dermatome
B. Sciatica
C. Lancinating pain that runs down the back of the leg in the S1 dermatome
D. Aching in the back of the leg in the S1 dermatome that is made worse by lumbar movements and sitting

Which of the following statements is correct:

A. Lancinating (zinging or electrical) pain is never caused by non-neurological sources
B. Aching pain can result from nerve root irritation if it is in the appropriate dermatome
C. Compression of the nerve root without damage or severe inflammation may cause pain
D. The nerve root may cause aching pain if it is damaged.

Letters

None Yet

NAIOMT News

Coming

If it ain't broke don't fix it.

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See you next month!