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Editorial Staff

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Inter- and intraexaminer reliability in identifying and classifying degenerative marrow (Modic) changes on lumbar spine magnetic resonance scans.

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Objective: Signal intensity changes noted on magnetic resonance imaging scans in degenerated disks and adjacent bone marrow have been described and labeled "Modic" changes. Three types are identified, with type 1 being linked to low back pain. This study reports on the reliability of identifying and categorizing Modic marrow changes as would be done in the normal course of clinical practice.

Methods: Fifty-one lumbar spine sagittal magnetic resonance imaging scans of adult male patients older than 40 years were used. Two radiologists independently read each case at two different periods; scans were reordered for the second reading. The radiologists recorded the presence or absence of Modic changes anywhere in the lumbar spine for each case and classified each one as type 1, type 2, or type 3, and the level or levels where they were noted. The κ statistic was used to evaluate inter- and intraexaminer agreement overall and by disk level. Percent agreement was also calculated.

Results: The overall κ value for the interexaminer agreement of diagnosing the presence/absence of Modic changes for the entire lumbar spine as well as classifying them when present was $\kappa = 0.52$ (moderate) with 71% agreement. At the L4 through 5 level, the κ value was 0.81 (substantial) with 92% agreement, and at the L5 through S1 level, the κ value was 0.58 (upper moderate) with 76% agreement. The L3 through L4 level had a κ value of 0.66 (strong) but was considered "unstable" because of the lack of variability within the cells of the contingency table. The intraexaminer reliability gave a κ value of 0.71 (strong) (82% agreement) for examiner 1 and a κ value of 0.87 (almost perfect) (92%) for examiner 2.

Conclusions: The Modic classification system shows moderate to almost perfect inter- and intraexaminer reliability in this study, simulating the methods of diagnosis used in clinical/radiological practice. The results of studies using the Modic system before investigations of its reliability can be viewed with more confidence, and future studies can continue to evaluate the link with patient symptoms and treatment outcomes.

Isometric force parameters and trunk muscle recruitment strategies in a population with low back pain.

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Objective: This study correlates changes in trunk isometric force parameters and trunk muscle recruitment strategies in subjects with low back pain (LBP) and in healthy participants.

Methods: A control group study with repeated measures was performed. Study participants included 15 control subjects and 14 patients with LBP. Participants were required to exert 50% and 75% of their maximal trunk flexion and extension. In a learning phase, feedback was provided, after which study participants were asked to perform 10 trials without any feedback. Spatiotemporal parameters of muscular activity and force production were recorded. Dependent variables included time to peak force, peak force variability, absolute error in peak force, electromyogram (EMG) burst duration for agonist muscles, and normalized integrated EMG.

Results: Average time to peak force was significantly longer for subjects with LBP than for healthy subjects. Subjects with LBP showed longer burst duration for all four muscles recorded. No group difference was noted in normalized integrated EMG.

Conclusions: We suggest that the observed changes in trunk motor control and trunk muscle recruitment strategies are not only mediated by a neurophysiologic adaptation to chronic pain but also by cognitive adaptations modulated by fear of movement and fear of reinjury.

Magnetic resonance imaging findings as predictors of clinical outcome in patients with sciatica receiving active conservative treatment.

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Objective: The aims of this study were to investigate the possible prognostic value of disk-related magnetic resonance imaging (MRI) findings in relation to recovery at 14 months in patients with severe sciatica, and whether improvement of disk herniation and/or nerve root compromise is concurrent with recovery.

Methods: All patients included in this prospective observational study of patients with sciatica receiving active conservative treatment were scanned at baseline and at 14 months' follow-up. Definite recovery at follow-up was defined as an absence of sciatic leg pain and a Roland Morris disability score of 3 or less. Potential predictors of interest were disk-related MRI findings in the lumbar spine. Bi- and multivariate logistic regression analyses were used to identify any predictors of recovery. Age, sex, and treatment were included in the analyses as possible confounding/modifying factors.

Results: According to the definitions used, 53% of 154 patients recovered; 63% of men (n = 84) and 40% of women (n = 70). In the multivariate analyses, broad-based protrusions, extrusions, and male sex were found to be predictive of a positive outcome. Sex was identified as a true confounder in that the prevalence of disk-related MRI findings was different for men and women, and they had different recovery rates. Improvement of disk herniations and nerve root compromise over time did not coincide with definite recovery.

Conclusions: In patients with sciatica receiving active conservative treatment, broad-based protrusions

and extrusions at baseline were positive predictors of definite recovery at 14 months. However, at 14 months the MRI-defined improvement of disk herniations and nerve root compromise was not correlated with definite recovery.

The reliability of a posterior-to-anterior spinal stiffness measuring system in a population of patients with low back pain.

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Objective: A system for measuring posterior-to-anterior spinal stiffness (PAS) was developed for use in clinical trials of manipulation for low back pain. The reliability of this device is under investigation in this study.

Methods: The PAS system uses electronic sensors to record displacement and force while a human operator provides the force of indentation. A test-retest design was used with measures repeated by the same operator within 5 minutes. Posterior-to-anterior loads were applied to each lumbar spinous process of patients lying prone on a hard flat bench. Force and displacement were recorded and used to calculate PAS.

Results: The subjects consisted of 22 males and 14 females; average age was 49.1 years (SD, 14.2). All subjects had low back pain of at least four weeks duration, with mean Roland-Morris scores of 7.6 (SD, 3.3). Spinal stiffness ranged from 4 to 26 N/mm (average, 11.2; SD, 3.5). Stiffness in the first and second tests varied on the average by 0.31 N/mm ($P = .03$). Standard error of the measurement was 1.62 N/mm. The single measures intraclass correlation coefficient (3,1) was 0.790 (95% confidence interval, 0.739-0.832).

Conclusions: The equipment and method produced repeatable results over the short-term. The system may be sensitive enough to detect changes in spinal stiffness that occur with care.

Results of chiropractic treatment of lumbopelvic fixation in 44 patients admitted to an orthopedic department.

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Objectives: The objectives of this study were to report on and evaluate the results of chiropractic care for patients with low back pain in an orthopedic department.

Methods: The target group consisted of 44 consecutive patients who experienced sudden and painful low back pain caused by lumbar flexion and rotation without axial loading. Clinical and neurologic examinations by orthopedic surgeons revealed no pathology; in addition, skeletal radiography, computerized tomography, and magnetic resonance imaging findings were all normal. Diagnosis before hospitalization was acute sciatica in all cases. Examination by the doctor of chiropractic indicated that the patients had lumbopelvic fixation. According to pre-established inclusion and exclusion criteria, 33 patients were treated in the chiropractor's clinic, whereas 11 who could not be transported were initially treated by the chiropractor in the hospital. The mean follow-up was two years.

Results: All but two patients returned to work. The period of sick leave among the patients was

reduced by two thirds as compared with that associated with conventional medical treatment.

Conclusions: To our knowledge, this is the first report on the work of a chiropractor participating within an orthopedic department of a Norwegian hospital as initiated by the hospital and with full support of the staff. The results support the initiative of the Norwegian government to increase reference to chiropractors in treating patients with neuromusculoskeletal dysfunctions. Based on our experience, we believe that the inclusion of chiropractors within hospital orthopedic departments is feasible and provides a patient care resource that may benefit not only the patients but also the department as a whole.

Headache caused by an intracranial aneurysm in a 32-year-old woman.

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Objectives: We describe the case of a woman with a headache later found to be a result of an intracranial aneurysm. Through this article, we aim to raise awareness regarding the *red flags* that should lead doctors of chiropractic to suspect the presence of this condition to facilitate appropriate patient management that increases the likelihood of patients' recovery.

Clinical Presentation: A 32-year-old woman sought care for a constant headache of four days' duration. She described the headache as severe throughout her entire head, centralized at the base of the occiput, and unlike any headache she had experienced. She had concomitant neck pain. Her left eye deviated toward the midline and had excessive tearing 12 hours after the onset of the headache.

Intervention and Outcome: No chiropractic adjustment was administered; immediate transfer for emergency treatment was arranged instead. The diagnosis of a bleeding intracranial aneurysm was confirmed by magnetic resonance imaging. The patient was transferred to a local university hospital for surgical intervention. Unfortunately, she died of vasospastic complications.

Conclusions: The red flags to be considered in evaluating patients with such headache as that described for our case patient include a history of hypertension, cigarette smoking, oral contraceptive use, alcohol consumption, pregnancy, and cocaine use. Practitioners need to be aware of the signs and symptoms that indicate whether a headache may be a result of serious problems such as an aneurysm.

Back and pelvic pain in an underserved United States pregnant population: a preliminary descriptive survey.

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Objective: The objective of this study was to identify the prevalence of back pain and treatment satisfaction in a population of low-socioeconomic pregnant women.

Methods: This study used a cross-sectional design to determine the prevalence of self-reported musculoskeletal pain in pregnancy for 599 women. Women completed an author-generated musculoskeletal survey in the second trimester of their pregnancy that addressed pain history, duration, location, and intensity, as well as activities of daily living, treatment frequency, and satisfaction with treatment.

Results: Sixty-seven percent of the total population reported musculoskeletal pain, and nearly half presented with a multi-focal pattern of pain that involved two or more sites. Twenty-one percent reported severe pain intensity rated on a numerical rating scale. Eighty percent of women experiencing pain slept less than four hours per night and 75% of these women took pain medications. Importantly, 85% of the women surveyed perceived that they had not been offered treatment for their musculoskeletal disorders.

Conclusion: Multi-focal musculoskeletal pain in pregnancy was prevalent in this underserved patient population. The pain in this population negatively affected sleep and treatment appeared inadequate.

A patient with deep vein thrombosis presenting to a chiropractic clinic: a case report.
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Objective: The objective of this article is to present and discuss a case of deep vein thrombosis in a chiropractic clinic setting.

Clinical Features: A 33-year-old male patient presented for follow-up chiropractic care for a long-term low back complaint. A working diagnosis of facet joint syndrome was made. Despite improvement of low back symptoms, the patient experienced right-sided groin pain. The patient was referred to the hospital with a provisional diagnosis of deep vein thrombosis.

Interventions and Outcomes: The patient consulted a physician, and within two hours of chiropractic consultation, his entire leg had become painful. Doppler ultrasound revealed extensive thrombosis. He was placed on heparin and was hospitalized for eight days. On discharge, a full-length right leg stocking and moderate exercise were recommended. Consecutive checkups were scheduled with the clot almost resolved at 19 months postdiagnosis.

Conclusion: This case report highlights the importance for the manipulative therapist to be aware of cardiovascular disease mechanisms and associated risk factors, so co-management via referral to the appropriate specialist can occur.

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