

Percutaneous cervical discectomy: preliminary experience

Bonaldi G, Minonzi G, Belloni G, Dorizzi A, Fachinetti P, Marra A, Goddi A. *Neuroradiology* 1994; 36:483-486.

We assessed the feasibility of percutaneous treatment of a cervical herniated disc. In the lumbar region, the surgical instrument for percutaneous discectomy passes only through the paravertebral muscles, while in the cervical region there is considerable risk of nervous, parenchymal and vascular lesions. Moreover, open surgery for cervical herniated nucleus pulposus is a well-established, low-risk procedure, with little risk of epidural fibrosis, the main complication of lumbar open surgery; a percutaneous procedure should therefore have a low morbidity rate. A safe percutaneous approach to cervical discs could be useful for biopsy and for treatment of high-risk patients for general anaesthesia. We treated 15 patients with cervical herniated nucleus pulposus; all gave informed consent and refused or were not eligible for open surgery. We used the Nucleotome® described for treatment of lumbar herniated discs; except for the first three cases, we used colour Doppler sonography to detect hazardous structures in the path of the probe. We had one complication, a cervical haematoma due to damage to the inferior thyroid artery, prior to the use of ultrasound.

Posterior lumbar apophyseal ring fractures: a report of 20 cases

Yang IK, Bahk YW, Choi KH, Paik MW, Shinn KS. *Neuroradiology* 1994; 36:453-455.

Posterior apophyseal ring fracture (PARF) of the lumbar spine is an uncommon injury thought usually to occur in adolescence. We analysed CT findings in 20 cases (19 patients), whose age ranged from 16 to 45 years (average 30 years). The PARF could be divided into two distinct groups on the basis of the shape and location of the fracture and the defect of the vertebral rim. In group 1 (2 cases), PARF involved the central aspect of the inferior vertebral rim and bone fragments were large and broad-based. In group 2, PARF were located at the posterolateral margin of the superior vertebral rim and bone fragments were small and focal. The great majority of previously reported cases belonged to our group 1. A pathogenesis for each group is suggested.

Imaging in acute basilar artery thrombosis

Castillo M, Falcone S, Naidich TP, Bowen B, Quencer RM. *Neuroradiology* 1994; 36:426-429.

The aim of this study was to review the imaging features in acute (<24 h) basilar artery thrombosis. CT and MR studies in 11 patients with clinical diagnosis of acute basilar artery thrombosis were retrospectively reviewed. MR angiography was obtained in 4 patients. Correlation with clinical symptoms were performed. Multiple cranial nerve palsies and hemiparesis were the most common clinical symptoms at presentation. CT revealed hyperdense basilar arteries ($n = 7$) and hypodensities in the posterior circulation territory ($n = 8$). In one instance, the infarction

was hemorrhagic. MR imaging showed absence of flow void within the basilar in 6 patients and MRA (using both PC and TOF techniques) confirmed absence of blood flow in 4 basilar arteries. One week after presentation, 5 patients died. Autopsy was obtained in 1 case and confirmed the diagnosis of basilar artery thrombosis. Basilar artery thrombosis has fairly typical imaging features by both CT and MR. MRA may be used to confirm the diagnosis. Prompt recognition may lead to early thrombolytic treatment and may improve survival.

Identification of risk components in exercise for the low back

Tornatore B, Karagiannis J, Polus BI, Walsh MJ. *Chiropractic Technique* 1994; 6(3):79-83.

Prescription of exercises for the low back is common both for preventative and rehabilitative reasons. Some of these exercises have the potential to aggravate or cause injury and the underlying mechanisms need to be understood. A literature search identified those low back exercises that have the potential to cause injury. Four major risk components were identified - rotation, hyperextension, axial loading, and increased discal pressure. For each of these components, the anatomical and biomechanical mechanisms of injury were identified. The significance of these findings for various exercises is discussed and a protocol developed for safe exercise prescription.

Congenital muscular torticollis in four-month old monozygous female twins: a case study

Pursell KJ. *Chiropractic: The Journal of Chiropractic Research and Clinical Investigation* 1994; 9(2):47-50.

A case study is presented of monozygous twin infants and their positive response to chiropractic care. There is a discussion of chiropractic etiological theory. A chiropractic case management model as well as surgical and chemotherapeutic treatments including the use of botulinum toxin-A are explored.

Aspirin does not affect exercise performance

Roi GS, Garagiola U, Verza P, Spadari G, Radice D, Zecca L, Cerretelli P. *Int J Sports Med* 1994; 15(5):224-227.

A single-blind, cross-over study was carried out to evaluate the effects of acetylsalicylic acid (ASA) on cardiorespiratory performance during exercise. Eighteen young men, 9 athletes and 9 untrained but active subjects, performed a progressive maximal exercise test on a cycle ergometer (30 watt, 3 min steps, starting at 60 watt) on three different occasions, after a single administration of plain aspirin (1000 mg of ASA), chewable buffered aspirin (1000 mg of ASA and 600 mg of calcium carbonate) and placebo. Continuous measurement of breath-by-breath ventilation, oxygen consumption, carbon dioxide output, respiratory frequency and heart rate was carried-out at rest and during the exercise test. Blood lactate concentration was measured just before

the start of exercise and at the third minute of each step in order to detect the anaerobic threshold. The pharmacokinetics of aspirin during exercise was also investigated in ten of the eighteen participants. The analysis of all investigated variables did not show any statistically significant difference between treatments, suggesting that a single dose of 1000 mg of aspirin does not affect physical performance during submaximal and maximal exercise.

Lifetime milk consumption and bone mineral density in older women

Soroko S, Holbrook TL, Edelstein S, Barret-Connor E.
Am J Public Health 1994; 84(8):1319-1322.

This study examined the relation between lifetime milk consumption and both axial and appendicular bone mineral density in 581 postmenopausal white women. Positive significant graded associations between milk consumption in adulthood and bone mineral density at the spine, total hip, trochanter, intertrochanter, and midradius, but not the ultradistal wrist or femoral neck, were observed. Adolescent milk consumption showed similar, statistically significant associations (spine and midradius). Associations were independent of age, body mass index, years postmenopausal, thiazide, estrogen and alcohol use, smoking, and exercise. Regular milk consumption in youth and adulthood is associated with better bone mineral density at cortical and trabecular sites in elderly women.

Muscle strength, voluntary activation, twitch properties, and endurance in patients with fibromyalgia

Norregaard J, Bülow PM, Danneskiold-Samsøe B.
J Neurol Neurosurg Psychiatry 1994; 57:1106-1111.

Previous studies have shown decreased voluntary muscle strength and endurance in patients with fibromyalgia. The aim of this study was to determine to what extent this is due to lack of exertion. The twitch interpolation technique was used to determine the degree of central activation and estimate the "true" quadriceps muscle strength in patients with fibromyalgia and age and sex matched controls. Subjects hereafter performed an endurance test consisting of repetitive contractions at 50% of estimated "true" muscle strength of four seconds duration followed by a six second rest until exhaustion, or maximally for 40 minutes. Twitch decline and increase in mean rectified EMG were used as objective markers of fatigue. The estimated "true" muscle strength was 82 (SD 26) Nm in 20 patients with fibromyalgia compared with 133 Nm (SD 28) Nm in the 21 controls ($p < 0.001$). The "true" muscle strength per cm^2 midhigh cross sectional area was lower 0.50 (SD 0.15) Nm/cm^2 in the patients compared with 0.74 (SD 0.15) Nm/cm^2 in the controls ($p < 0.001$). The decline over time in twitch sizes was similar in the two groups. The mean rectified EMG signal at a fixed force level of 50% of "true" muscle strength increased similarly in the two groups. Relaxation rates and contraction rates also increased equally in the two groups. In conclusion, a reduction of the estimated

muscle strength per area unit of about 35% was found in the patients with fibromyalgia. This might be secondary to physical inactivity or neuroendocrine factors. No differences in changes in the neurophysiological indices associated with fatigue were found between the two groups.

Caffeine and sports activity: a review

Nehlig A, Derby G.
Int J Sports Med 1994; 15(5):215-223.

Potential ergogenic effects of caffeine at the cellular level are mediated by three main mechanisms of action which are: intracellular mobilization of calcium from sarcoplasmic reticulum and increased sensitivity of myofibrils to calcium; inhibition of phosphodiesterases leading to an increase in cyclic-3',5'-adenosine monophosphate (cAMP) in various tissues including muscle; and the antagonism at the level of adenosine receptors, mainly in the central nervous system. The main mechanism of action of caffeine at the level usually encountered *in vivo* after the ingestion of a few cups of coffee is undoubtedly linked to the antagonism of caffeine at adenosine receptors. Caffeine also increases production of plasma catecholamines that allow the body to adapt to the stress created by physical exercise. Catecholamine production increases probably, in turn, the availability of free fatty acids as muscle substrates during work, thus allowing glycogen sparing. Caffeine is able to increase muscle contractility, has no ergogenic effect on intense exercise of brief duration, but can improve the time before exhaustion. Caffeine is also able to improve physical performance and endurance during prolonged activity of submaximal intensity. Glycogen sparing resulting from increased rate of lipolysis could contribute to the prolonged time to exhaustion. Finally, tolerance to the methylxanthine should be taken into account when an athlete wants to draw any benefit from caffeine absorption prior to a sports event.

Lumbar spine surgery and mortality among Medicare beneficiaries, 1986

Oldridge NB, Yuan Z, Stoll JE, Rimm AR.
Am J Public Health 1994; 84(8):1292-1298.

Objectives. The purpose of this study was to compare lumbar spine surgical procedures by age, gender, and number of comorbidities with respect to mortality in patients 65 years of age and older in the United States.

Methods. A 100% sample of the 1986 Medicare inpatient Health Care Financing Administration claims files databases involving lumbar spine surgical procedures was analyzed.

Results. Lumbar spine surgery in 34,418 patients (median age = 71 years) was associated with a significant increase in in-hospital and 1-year cumulative mortality only beyond 80 years of age. When adjusted for age, in-hospital and 1-year cumulative mortality with both decompression and excision procedures were significantly higher in men than in women. When adjusted for both age and gender, mortality

increased significantly as the number of comorbidities increased.

Conclusions. With lumbar spine surgery in elderly patients, mortality did not significantly increase until 80 years of age and was consistently associated with decompression and excision, with male gender, and with an increase in number of comorbidities.

Infarcts in the territory of the lateral branch of the posterior inferior cerebellar artery

Barth A, Bogousslavsky J, Regli F.
J Neurol Neurosurg Psychiatry 1994; 57:1073-1076.

The territory of the lateral branch of the posterior inferior cerebellar artery (IPICA) supplies the anterolateral region of the caudal part of the cerebellar hemisphere. Because infarcts in the territory of the IPICA have rarely been studied specifically, 10 patients with this type of infarct are reported. An IPICA infarct was isolated in only three patients, whereas it was associated with brainstem infarct in four, with occipital infarct in one, and with multiple infarcts in two patients. The most common symptom at onset was acute unsteadiness and gait ataxia without rotatory vertigo (six patients). Unilateral cerebellar dysfunction was found in all patients, with limb ataxia (nine patients), dysidiadochokinesia (five patients), and ipsilateral body sway (four patients), but dysarthria and primary position nystagmus were notably absent. In the patients with a coexisting infarct in the brainstem, cranial nerve and sensorimotor dysfunction was prominent and often masked the signs of cerebellar dysfunction. Unlike other infarcts in the PICA territory, IPICA territory infarcts were mainly associated with vertebral artery atherosclerosis (six patients), whereas cardiac embolism was less common (three patients). Unilateral limb ataxia without dysarthria or vestibular signs suggests isolated IPICA territory infarction and should allow its differentiation from other cerebellar infarcts.

Examination findings in legally confirmed child sexual abuse: it's normal to be normal

Adams JA, Harper K, Knudson S, Revilla J.
Pediatrics 1994; 94:310-317.

Background. Studies of alleged victims of child sexual abuse vary greatly in the reported frequency of physical findings based on differences in definition of abuse and of "findings". This study was designed to determine the frequency of abnormal findings in a population of children with legal confirmation of sexual abuse, using a standardized classification system for colposcopic photographic findings.

Methods. Case files and colposcopic photographs of 236 children with perpetrator conviction for sexual abuse, were reviewed. The photos were reviewed blindly by a team member other than the examiner, and specific anatomical findings were noted and classified as normal to abnormal on a scale of 1 to 5. Historical and behavioral information, as well as legal outcome was recorded, and all data entered into a dBase III program. Correlations were sought between abnormal findings and other variables.

Results. The mean age of the patients was 9.0 years (range from 8 months to 17 years, 11 months), with 63% reporting penile-genital contact. Genital examination findings in girls were normal in 28%, nonspecific in 49%, suspicious in 9%, and abnormal in 14% of cases. Abnormal anal findings were found in only 1% of patients. Using discriminant analysis, the two factors which significantly correlated with the presence of abnormal genital findings in girls were the time since the last incident, and a history of blood being reported at the time of the molest.

Conclusions. Abnormal genital findings are not common in sexually abused girls, based on a standardized classification system. More emphasis should be placed on documenting the child's description of the molestation, and educating prosecutors that, for children alleging abuse: "It's normal to be normal."

Management of patients with vertebrobasilar ischemia

Durrett LC.
Chiropractic Technique 1994; 6(3):95-97.

There has been much controversy in the past regarding postmanipulative cerebrovascular accidents. Some authorities believe that cervical adjusting should cease at the first symptom of vertebrobasilar ischemia. Other authorities state that chiropractic adjustments often correct the spinal problems causing symptoms of vertebrobasilar ischemia. The purpose of this paper is to provide the clinician with a workable procedure of managing cases in which vertebrobasilar ischemia is suspected.

Subacromial impingement syndrome: a case series

Williams BD, Brockhohn JL.
Chiro Sports Med 1994; 8(3):104-109.

This article will pay particular attention to the cause-and-effect relationship by which chronic repetitive or acute traumatic forces produce tissue alteration, leading to mechanical impingement of the subacromial space. This article will give special emphasis to impingement in the athlete. A case series including six patients, ranging in age from 23 to 85 years, is reviewed. In all cases, significant improvement was achieved through the conservative treatment measures described. Conservative treatment intervention and shoulder girdle rehabilitation can be effective in managing this condition.

Force and time characteristics of Pierce Technique cervical adjustments²

Wood J, Adams AA, Hansmeier D. Chiropractic: The Journal of Chiropractic Research and Clinical Investigation 1994; 9(2):39-43.

Force and time characteristics of Pierce Technique cervical adjustment of the occiput, C2, C5, and C6 were studied. A chiropractor with over

thirty years of experience adjusted symptomatic patients using a Thompson table. Typically, an initial pre-thrust (initial preforce) was increased to a maximum pre-thrust force (maximum preforce) and then the pre-thrust force (minimum preforce) was decreased before the thrust was given. Two peak adjustment forces commonly were present in the occiput and C2 while the second peak force was characteristically absent at C5 and C6. Release force was significantly correlated with peak force developed at C5 and C6. Peak forces recorded in this study were typically 100 N more powerful than previously reported cervical spine adjustments using other techniques.

Contour representation of sway area in posturography and its application

Jeong BY.

Arch Phys Med Rehabil 1994; 75:951-956.

The representation of postural sway tendency in posturography is important to understand the features of body balance system and a variety of postural disorders. This study is concerned with the contour representation and analysis of postural sway trajectory in posturography. We propose two methodologies to derive the contour of postural sway based on the boundary points of sway area. An algorithm for finding the sway contour in each method was developed, and the experiments were performed to examine the computational efficiency between the methods proposed. Fourteen able-bodied men were asked to stand upright on a force platform to compare the numerical measures of sway shape with other quantitative sway measures used in previous research into balance. The results show that numerical measures of sway contour (area, perimeter, and complexity of sway shape) and radius length diagram can be used to describe the tendency of sway shape, whereas other quantitative sway measures represent the extent of sway amounts.

Stretching exercises: effect on passive extensibility and stiffness in short hamstrings of healthy subjects

Halbertsma JPK, Goeken LNH.

Arch Phys Med Rehabil 1994; 75:976-981.

Passive muscle stretch tests are common practice in physical therapy and rehabilitation medicine. However, the effects of stretching exercises are not well known. With an instrumental straight-leg-raising set-up the extensibility, stiffness, and electromyographic activity of the hamstring muscles have been experimentally determined and the effects of stretching exercises have been evaluated. Fourteen volunteers, aged 20 to 38 years (mean 27.3) were selected from a young healthy population with the toe-touch test (finger-ground distance greater than 0 cm), and a straight-leg-raising angle about 80°. According to usual standards the diagnosis was short hamstrings. One group of seven subjects was treated during 4 weeks with a daily home exercise program aimed at stretching the hamstrings, whereas the untreated group was used as a control. Instrumental straight-leg-raising was performed in the subjects of both groups. The significance of the differences between the mean values was determined with the Student's *t*-test. Comparison of the data

obtained before and after the muscle stretching program showed a slight but significant increase in the extensibility of the hamstrings accompanied with a significant increase of the stretching moment tolerated by the passive hamstring muscles. However, the elasticity remained the same. It is concluded that stretching exercises do not make short hamstrings any longer or less stiff, but only influence the stretch tolerance.

Physical modalities in rheumatological rehabilitation

Nicholas JJ.

Arch Phys Med Rehabil 1994; 75:994-1001.

Physical modalities continue to be a part of the rehabilitation treatment of patients with arthritis. Databases Medline (1980-1992) and National Rehabilitation Information Center, Rehabdata (1956-1992), were searched for "arthritis" and (1) diathermy, (2) massage, (3) transcutaneous electrical nerve stimulation (TENS), (4) hydrotherapy, (5) counterirritants, (6) topical ointments, (7) compression gloves, (8) superficial heat, and (9) acupuncture. The results suggest that scientific publication related to the treatment of arthritis with physical modalities has been recently less frequent. The literature reviewed suggested that ablative diathermy may be fruitful for wider trials for persistently inflamed joints, and TENS and capsaicin can provide pain relief in osteoarthritis if it is possible to deliver the treatment fully and persistently.

Dermatome somatosensory evoked potentials: a review of the literature

Swenson RS.

JNMS: Journal of the Neuromusculoskeletal System 1994; 2(2):45-51.

Somatosensory evoked potentials have been used to evaluate peripheral and central sensory conduction since the advent of signal processing capability in the 1960s. However, the classic techniques of mixed (sensory and motor) nerve stimulation provide limited information about single nerve roots. Therefore, more selective methods of stimulation have been proposed to evaluate nerve roots. Somatosensory evoked potentials to dermatome stimulation have been investigated since the first reports in the late 1970s. This review article described the experience with dermatome somatosensory evoked potentials since that time and points out areas requiring further investigation.

Traumatic injuries in off-road bicycling

Kronisch RL, Rubin AL.

Clin J Sport Med 1994; 4(4):240-244.

Two hundred sixty-five members of 21 off-road cycling clubs in 12 states completed a four-page questionnaire regarding their riding habits and injury history for the 1992 cycling season. The response rate was 62.4%. Of those surveyed, 85.7% reported injuries that were sustained while mountain biking during the preceding 12 months, with abrasions, contusions, and lacerations being reported most frequently. Injuries

were considered significant if the cyclist sought medical attention for the injury and was unable to ride for at least 1 day due to the injury. Sixty injuries met these criteria. Of those, 90% were traumatic in nature, making the incidence of significant traumatic injury 20.4% in this group for the year studied. Fractures were the most common significant traumatic injury reported. The shoulder complex was the most commonly injured anatomic region. Loss of control, high-speed descent, and competitive activity were identified as variables associated with traumatic injury. Competitive activity level was the only independent risk factor positively associated with traumatic injury, with an adjusted odds ratio of 4.24 ($p < 0.0001$).

Chiropractic management of Achilles tendinitis

Brantingham JW, Silverman JT, Deliman AD, Snyder WR, Wong J.
JNMS: Journal of the Neuromusculoskeletal System 1994; 2(2):52-55.

The etiology, pathomechanics, standard medical, and chiropractic management of Achilles tendinitis are discussed. A case history and chiropractic management of one patient are described in detail. Using the visual analog scale and converting to percent there was approximately a 70% reduction of pain and dysfunction with chiropractic management after standard medical care had failed over the previous 3 years. Randomized controlled trials are needed to determine the efficacy of chiropractic foot care for Achilles tendinitis and other related foot disorders.

Descriptive anatomy of the perivascular connective tissue of the vertebral artery and its clinical relevance to vertebrovascular accidents

Chen J, Lantz CA, Thorp D.
JNMS: Journal of the Neuromusculoskeletal System 1994; 2:56-64.

Little is known regarding the mechanism or etiologies of stroke or vertebrovascular accidents (VVA) associated with cervical adjustive procedures (CAP). Of all proposed etiological factors, we suggest that intimal tearing is the most plausible cause. Intimal tearing of the vertebral artery (VA) attributed only to atlas rotation and the large available movement of the C1-C2 motion segment was not felt to sufficiently explain the propensity for VVA associated with the upper cervical spine. An anatomical study was conducted to investigate features that may predispose the upper cervical portion of the VA to VVA when manipulated.

The investing fascia of the VA forms a perivascular fibrous sheath (PFS) which extends from the origin at the subclavian artery to the entry of the VA into the meninges. The PFS is fused with the periosteum lining the foramen of the transverse process of C1-C6, and is integrally associated with the epineurium of the ventral rami of C2-C6. Cross sectional histological preparations of a PFS show that it is composed of strands of dense regular connective tissue, vasculature, and adipocytes. The PFS was found to attach the VA to the capsule of the C1-C2 zygapophyseal joint firmly enough to resist 200 g of traction force in six of seven specimens tested. Adhesion of the VA to the PFS through

strands of collagenous tissue was confirmed histologically in a single specimen. Adherence of the VA to the lateral aspect of the C1-C2 joint capsule via the PFS may offer additional insight into the mechanism of and propensity for VVA in the upper cervical spine associated with CAP.

Intra- and interexaminer reliability of certain pelvic palpatory procedures and the sitting flexion test for sacroiliac joint mobility and dysfunction

Paydar D, Thiel H, Gemmell H.
JNMS: Journal of the Neuromusculoskeletal System 1994; 2(2):65-69.

The purpose of this study was to establish the intra- and interexaminer reliability for assessing relative iliac crest height, palpatory tenderness over the posterior superior iliac spines, and the sitting flexion test using two examiners and 32 asymptomatic subjects. Tenderness to palpation over the posterior superior iliac spines was the only parameter giving significant agreement above chance ($p < 0.05$) for both the intra- and interexaminer scenarios. The Kappa values for assessing relative iliac crest and posterior superior iliac spine heights, as well as for the sitting flexion test, ranged from -0.08 to 0.29, indicating only poor-to-fair intra- and interexaminer concordance. This study supports the findings of similar reports, with palpatory tenderness being one of the most reliable findings.

Post-polio syndrome: a case report

Bougie JD, Cassidy JD, Donat JR.
JNMS: Journal of the Neuromusculoskeletal System 1994; 2(2):75-78.

Post-polio syndrome (PPS) is the name given to late symptoms of weakness, pain, and fatigue experienced by patients who were afflicted with poliomyelitis. Although cases have been reported in the literature since the 1800s, PPS is capturing more attention in recent years. This is due to the sheer numbers of survivors from the last epidemic reporting new difficulties. The diagnosis is complex because the symptoms are similar to many musculoskeletal problems. There is no definitive test to confirm the diagnosis, and primary care providers must suspect PPS in patients who have a history of polio.

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