ROUNDUP360

Spine

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Does cervical spondylomyopathy treatment need corpectomy

Patients with cervical spondylosis at two adjacent levels can be treated in a number of different ways. One of the fundamental differences in approach is in cases of multilevel disease where removal of the vertebral body may offer improved outcomes. While this is a relatively common problem, there is surprisingly little in the way of consensus as to how best to manage these patients, with the balance of risks and benefits so far unclear. In a very thorough and timely meta-analysis, surgeons in **Wenzhou (China)** set out to establish if anterior cervical corpectomy and fusion (ACCF) offered any benefits over anterior cervical discectomy and fusion (ACDF) in patients presenting with two adjacent-level cervical spondylosis myelopathy (CSM).[1] They designed a meta-analysis using the tried and trusted Cochrane meta-analysis methodology for assessing risk of bias, and pooled risk ratios of dichotomous outcomes were used to assess the potential benefits of each approach. Following a thorough literature review of the major literature indices, the study team identified nine eligible trials reporting the outcomes of 631 patients that were suitable for inclusion. The authors included both randomised and non-randomised studies that evaluated comparative outcomes of the two approaches. The headline result of this meta-analysis is that there were no differences in hospital stay or outcomes (as measured by the Japanese Orthopaedic Association (JOA) score and visual analogue scale (VAS) score (neck and arm pain)). Similarly, the researchers were not able to distinguish any differences in clinical outcomes including cervical range of movement, fusion success, adjacent segment disease rates or reported complication rates. However, as would be expected there were some advantages associated with the smaller operation of ACDF. Patients undergoing ACDF had significantly less bleeding and a shorter operation time. In addition to this, as would be expected with maintaining the cervical body, patients maintained a more normal cervical lordosis and suffered less loss of height or graft subsidence when compared with ACCF. Although the authors conclude with the traditional statement 'additional high-quality RCTs and a longer follow-up duration are needed', we wonder in this case if it really is. The two treatments appear to be roughly comparable in clinical outcomes, but the smaller ACDF has the advantage of being a smaller procedure with maintenance of normal cervical anatomy.

Microdiscectomy not exactly a hands-down winner!

Seemingly as formidable as the Chinese economy, there are few topics to which the Chinese have not now applied meta-analysis or systematic review. One recent glaring omission, however, is that of the humble discectomy. The review team in **Chonquing (China)** designed a comprehensive meta-analysis to establish if the recent trend towards minimally invasive microdiscectomy is based on evidence or simply fashion.[2] They reviewed the literature with an extensive search of PubMed, EMBASE, the Cochrane Library and the Chinese Biomedical Database. Given the relative frequency of high quality studies, they were able to limit their search to randomised controlled trials comparing minimally invasive with standard discectomy approaches. As would be expected, the study team independently reviewed the quality of evidence, risk of bias and extracted data from the studies to compare an exhaustive range of outcomes including surgical time, blood loss, visual analogue scale (VAS), hospital length of stay, recurrence rates, X-ray exposure and surgical costs. They performed their meta-analysis using the Cochrane methodology and RevMan software. There were 16 RCTs that met the authors' inclusion criteria, reporting the results of 2139 patients with a high quality methodology. The risk of recurrence following discectomy was nearly double in the minimally invasive group (relative risk 1.95) and although it was associated with a smaller incision and shorter hospital stay, this economic benefit is offset by a longer operative time. In terms of outcomes, there were no differences to find in VAS score after the surgery, patient or surgeon X-ray exposure, or health economic costs. It is perhaps a case of horses for courses and while the review authors concluded that minimally invasive surgery should be popularised as it 'minimises patient suffering whilst in hospital', they haven't actually presented any data to support this claim. The nearly double recurrence rate and equivalent health economic costs would make standard discectomy a more attractive option to many patients and surgeons.

Lumbar spinal stenosis unpicked

Lumbar spinal stenosis is a condition with as many presentations as treatments. Surgeons throughout the world use different protocols and treatment strategies, and there is little in the way of consensus as to what current practice is. In a very useful exercise, researchers in **Leiden (The Netherlands)** conducted a national survey of spinal surgeons with the aim of establishing agreement for indications and choice of particular interventions.[3] This may seem simple, but consensus is the first step in building an evidence base, and is useful not only as a snapshot of what current practice is, but also lays the foundation for designing randomised controlled trials. The researchers established the current practices of 106 Dutch neurosurgeons and their treatment preferences for lumbar spinal stenosis treatments. The responders accounted for 6971 decompression

operations and 831 spinal fusion procedures per annum, giving the results of this survey a high level of credibility as to what constitutes current practice. The surgeons polled cited their key symptomatic indications for decompression as neurogenic claudication, severe pain and disability. These had to be experienced in combination with a pronounced stenosis of the spinal canal as the important indication for surgical treatment. Those who responded regarded conservative treatment options as ineffective and believed these to be less effective than surgical treatment. Around half of responders (68% of neurosurgeons and 52% of orthopaedic surgeons) preferred interlaminar decompression as treatment for lumbar spinal stenosis. Only around one in ten surgeons (12%) routinely performed concomitant fusion, although the majority of responding surgeons performed fusion routinely in the presence of spondylolisthesis. There is a surprising consensus among surgeons from both specialties treating lumbar spinal stenosis, and the responses presented here could easily be used as a basis for designing a randomised controlled trial or national guidance.

Wallis implant helpful in lumbosacral decompression

■ The employment of reconstructive ligaments in surgical decompression of the lumbar spine is controversial to say the least. There has been a complete lack of evidence to support their use, making their recommendation difficult. Surgeons in **Croydon (UK)**, not content with the lack of evidence, designed the only (to our knowledge) randomised controlled trial examining the use of reconstructive ligaments after lumbar decompressive surgery.[4] They undertook this trial in 60 patients who were randomised to either standard decompression or decompression with the use of the Wallis implant to improve outcomes in patients following lumbar surgery. Patients were assigned randomly into equal groups with or without ligament reconstruction. The study team selected the primary outcome measures of VAS score for back and leg pain and the Oswestry disability index. In addition, the surgeons recorded adverse events and surgical outcomes. The outcomes were improved in both groups with no increased adverse events or perceived drawback to the Wallis implant. However, although the ligament group did slightly better, this difference was not significant between the groups. The authors conclude that while the Wallis implant is a safe medical device, however their study does not demonstrate any clinical advantage to its use. This may be due to underpowering, or there may indeed be no significant differences.

Multidisciplinary rehabilitation good for back pain

■ Treatment of chronic low back pain is known to be most effective when attacked from all angles. A combination of analgesia, rehabilitation, pain control and in certain indications, injections or surgery, is offered in the majority of units throughout the world. While there has been much research surrounding the analgesia and surgical aspects of back pain care, there has been little high quality research evaluating the relative benefits of a multidisciplinary rehabilitation programme. Outcomes assessed included disability, kinesiophobia, catastrophising, pain, quality of life and gait disturbances in patients with chronic low back pain (CLBP). The research team in **Lissone (Italy)** designed a parallel-group, randomised, superiority-controlled pilot study to establish the feasibility of a larger study.[5] They recruited and randomised 20 patients to either a programme of motor training (spinal stabilising exercises plus usual-care) and cognitive-behavioural therapy or usual-care alone. Patients were all managed conservatively for their isolated lower back pain and outcomes were assessed using a range of measures (Oswestry Disability Index, the Tampa Scale for Kinesiophobia), pain scores (the Pain Catastrophizing Scale, and VAS pain score), and quality of life assessments (Short-Form Health Survey). In addition to the outcome measures, the investigators also evaluated some spatio-temporal gait parameters using a gait analysis system. Outcomes were assessed using a linear mixed model for repeated measures for each outcome measure. Despite this only being a pilot study, there were significant differences in each group, with group and time-by-group significant differences in disability assessment (improvement of around 60% vs 25%). There were similar improvements found in the secondary outcome measures of kinesiophobia, catastrophising, and quality of life measures, all in favour of the multidisciplinary approach. From a functional perspective there were similar levels of general improvement in gait parameters in both groups. This pilot study certainly supports the use of this multidisciplinary approach, and with a significant positive such as this and a large effect size, a definitive study may not be required.

Understanding the sciatic stretch test

x-ref Research

■ In twin studies from **Kuopio (Finland)**, an innovative research team have investigated the biological basis for the sciatic stress test.[6] A staple of clinical examination from medical students through to consultant spinal surgeons, there is a general consensus that the biological basis of the stress test is that the straight leg raise (SLR) causes some caudal movement of the nerve roots. What is not clearly defined is what the magnitude of movement is, and in which direction. In the first of their investigations, these canny scientists used 16 healthy asymptomatic volunteers to investigate the magnitude of displacement of the nerve roots with the SLR. The study used a 1.5T MRI scanner and scans were acquired using a T2-weighted turbo spin-echo fat-saturation sequence. The volunteers underwent scans with either an SLR or not in a random order, and the displacement of the nerve roots was measured by two observers using the position of the conus as a marker. In this initial study, the displacement of the conus was seen to be just over 2.3 mm caudally (± 1.2 mm) with the right SLR, and similarly 2.35 (± 1.2 mm) with the left SLR. The intra- and inter-observer reliabilities were extremely high, with correlation coefficients well above 0.9. In the second portion of this study, the same team sought to establish if there was a difference in the magnitude of excursion seen with the mechanical effects on the cord between the unilateral and bilateral straight leg raise. Using an identical methodology (and one assumes the same 16 volunteers), the study team investigated the differences between bilateral and unilateral straight leg raise.[7] In this case when compared with the normal position, the conus displaced caudally in the spinal canal by 2.33 (± 1.2 mm) with unilateral, and 4.58 (± 1.48 mm) with bilateral SLR. Again there were excellent intra- and inter-observer correlation coefficients.[7] It does appear from this body of work that previous assumptions about the mechanical nature of the SLR and sciatic stretch test are correct, and furthermore that the use of the bilateral test causes further excursion

of the nerve roots and the conus. We would love to see a similar study with symptomatic patients which may shed light on the mechanical effects of the cause of pain.

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