ROUNDUP360

Spine

Xref *For other Roundups in this issue that cross-reference with Spine see: Knee Roundup 4.*

Medical treatment for ankylosing spondylitis Xref

■ Ankylosing spondylitis is a seronegative arthropathy that has multiple orthopaedic sequelae, most notably in the spine and hips. Medical management has, for the most part, revolved around management of pain and the use of anti-inflammatories with little in the way of efficacious treatments. Researchers in **Amsterdam (The Netherlands)** have evaluated a new medical intervention for ankylosing spondylitis in the form of secukinumab. Secukinumab is a monoclonal antibody directed against IL17-A which is thought to be a key mediator in ankylosing spondylitis. The research team conducted a randomised controlled 'proof of concept' trial involving eight centres in Europe. Patients were randomised to either intravenous secukinumab (2×10 mg/kg) or placebo, given three weeks apart. The primary end point was a 20% improvement on the Assessment of SpondyloArthritis International Society score, and an assessment of safety was made at up to 28 weeks' follow-up. This proof of concept pilot study included 30 patients who were randomised in a 4:1 ratio to either intravenous secukinumab (n = 24) or placebo (n = 6). Outcomes assessed at week six demonstrated a significantly greater improvement in the secukinumab *versus* the placebo group (59% *versus* 24%).[1] This early pilot study is extremely encouraging. With only a single adverse event (abscess at infusion site), the early results of anti-IL17-A look extremely promising. We eagerly await the phase two clinical trial. This pilot study is an exciting development in a difficult to treat condition.

Unilateral TLIF effective

■ Transverse lumbar interbody fusion (TLIF) is a well described method for treating patients with a variety of degenerative lumbar spine disorders. It is common practice to perform bilateral decompression and fusion, however, surgeons in **Shanghai (China)** hypothesised that similar outcomes could be achieved with a unilateral approach. They designed a prospective randomised controlled trial to establish the benefit or otherwise of unilateral fusion. Over a three-year period the study team were able to recruit 68 patients into the study. All patients had severe radicular and lower back pain. Patients all underwent decompression and fusion of two levels. They were randomised to either bilateral or unilateral instrumentation. Outcomes were assessed for operative outcomes (operative time, blood loss, hospital length of stay), post-operative outcomes (fusion rate, complication rates) and functional outcomes (visual analogue scores, SF36 and Oswestry Disability Index). The study team did not observe any major differences between any outcome measures recorded in the study. Both patient groups had significant improvements in functional outcomes post-operatively. There was no significant difference in surgical outcomes or complications between the two groups, however, the unilateral TLIF group had a significantly shorter operative time, less blood loss and lower implant costs compared with the unilateral group.[2] The results of this study may not be adopted universally as, despite the clearly comparable outcomes between the two groups, conventional wisdom favours a bilateral fixation with pedicle screws. The authors emphasise that although their protocol only results in instrumentation of one side of the lumbar spine, they prepare the end plate and insert the cage across both sides of the vertebral column.

Peg fractures akin to neck of femur fractures

■ There has been much focus on the serious ramifications of many elderly fractures including hip and wrist fractures. The research and professional focus on the outcomes of this group of frail, elderly patients has improved, with targets now focused upon the outcomes in patients who have sustained a neck of femur fracture. Similar 'celebrity status' has not been shared by all elderly fragility fractures. Fragility fractures of the spine occur in a similar group of patients and although some research has been undertaken on the importance of lumbar spine fragility fractures, almost no attention has been paid to the consequences of an odontoid peg fracture. Researchers in **Leicester (UK)** have turned their attention to the survivorship of elderly patients with odontoid peg fractures. They conducted a comparative survivorship study of two cohorts of elderly patients. One cohort had sustained an isolated odontoid peg fracture and the other a fracture of the hip or wrist. The researchers performed a retrospective study over a six-year period. They included all patients admitted to their institution with an isolated odontoid peg fracture. These were then compared with a cohort of hip and wrist fractures admitted in the same time period. There were 32 patients with an odontoid peg fracture, 702 hip fracture patients and 221 wrist fracture patients. The overall mortality rate in the peg fracture group was 37.5% (n = 12) at one year which was highest in the first three months. The overall rate of mortality at one year was 32% (n = 225/702) for patients with a fracture of the hip and 4% (n = 9/221) for those with a fracture of the wrist. The survivorship of the hip and odontoid peg fracture groups was almost identical, however, both were significantly poorer than those in the wrist fracture group.[3] Although a relatively rare diagnosis, an odontoid peg fracture is a significant injury that carries with it a similar morbidity and mortality burden to a hip fracture.

Sleep apnoea and spinal surgery Xref

■ In a short but topical paper, researchers in **Salzburg (Austria)** ask if there is any impact of sleep apnoea on the outcomes of lumbar spi-

nal surgery. It would be reasonable to think that patients with significant airway disease might have difficulties with respiratory complications in the peri-operative period, particularly in spinal surgery where the patient has to be prone for long periods of time. The research team utilised a national database to identify patients who underwent lumbar spine fusion over a four-year period, both with and without sub-group analysis of sleep apnoea patients. The research team were able to identify the records of 84 655 patients for inclusion in the study, of whom 6163 (7.28%) had been diagnosed with sleep apnoea at the time of their surgery. Patients in the sleep apnoea subgroup were older, more likely to be female and had more comorbidities than their normal counterparts. The study team used regression analysis to account for confounding variables, and sleep apnoea was confirmed to be an independent risk factor for complications (OR 1.50), transfusion requirement (OR 1.12), mechanical ventilation (OR 6.97), admission to ICU critical care services (OR 1.86), and prolonged hospitalisation (OR 1.28).[4] Management of patients with modifiable risk factors for poor outcome and complications post-operatively is a difficult and increasingly common problem. The health economic argument would be firmly in favour of instigating a weight loss regime prior to listing for surgery to reduce not just the complications of the surgery but the lifelong disease burden of obstructive sleep apnoea. If the patients wish to continue with surgery without losing weight the complication rates detailed here will serve to inform patients and surgeons alike of their risks.

Scoliosis in osteogenesis imperfecta Xref

■ Osteogenesis imperfecta is a disease of collagen that results in brittle bones. Although four types were originally characterised, it is now known that there are more than 20 types, many with variable penetrance. As medical therapy is improving, children are suffering fewer fractures and living longer. Spinal deformity, however, continues to cause difficulties for these patients and is a common complication. The relationship between the disease, the curve and the growth of the child is not really understood. Intervention in scoliosis is dependent on being able to predict the progression of the curve and it is not unreasonable to assert that this is likely to be different in osteogenesis patients. A team of spinal surgeons based in **Chicago (USA)** set out to review the medical records of 316 patients with osteogenesis imperfecta. The patients were subdivided according to the Sillence type, and serial curve measurements were recorded throughout the follow-up period for each patient with scoliosis. There was a prevalence of scoliosis of 50% (n = 157/316) and a mean progression of between 1° and 6° per year depending on the severity of osteogenesis. Curve progression was reduced in patients with early bisphosphonate therapy only in type III.[5] As would be expected, osteogenesis imperfecta was associated with a high prevalence and rate of curve progression which was dependent on the severity of the disease.

Paediatric atlanto-occipital dislocation Xref

■ The paediatric spinal injury is a difficult and challenging condition to treat. Children often have ligamentous laxity and, due to the different viscoelastic properties of their ligaments and bone, injure themselves with different patterns to adults. Atlanto-occipital dislocation is a rare condition that can be associated with severe neurological compromise and often death of the patient. Surgeons in **Memphis (USA)** present an interesting demographic study of what is an extremely rare condition. They were able to report their experience of just 14 cases over a 20-year period. In their series, these injuries occurred most commonly around the age of five and were most commonly caused by road traffic accidents. The majority of patients (n = 12) had significant other injuries (79% brain injury, 50% spinal cord injury).[6] Patients were managed operatively with fusion and this was successful in all patients although 29% developed hydrocephalus. At the latest follow-up, around half of the patients had a significant permanent neurological deficit. Early occipitocervical fusion and stabilisation yielded acceptable results in this small but significant case series.[6] The real take-home message for us here is that, with over one in four patients developing hydrocephalus post-operatively, the surgeons should be on guard and act promptly should any neurological decline be observed.

Back pain and obesity: chicken or egg?

■ The weight of evidence concerning obesity and back pain is growing. We know that obese patients are more likely to suffer back pain, be depressed and do less well following surgery (possibly due to the depression). However, what we don't really have a clear understanding of is the interaction between obesity and low back pain. Surely physical activity and exercise must play some role in this, however, nothing is currently known on the topic. Researchers is **Stamford (USA)** designed a clever cross-sectional population study in an attempt to understand the interrelationship between physical activity, obesity, and lumbar back pain. The study cohort was formed from a cohort of 6796 adults identified as part of the 2003–2004 National Health and Nutrition Examination Survey. The study team collated demographic information, details of health status, physical examination and a seven-day physical activity monitoring programme (determined by body worn accelerometers). The presence or absence of lumbar back pain was determined by questionnaire response. Physical activity was computed using intensity cut-offs and percentile intensities. An advanced statistical model based on adjusted weighted logistic regression models (utilising data such as demographics and comorbidities) was constructed using Akaike Information Criterion.[7] The study team identified the risk of LBP to increase in proportion with BMI (2.9% for normal BMI to 7.7% for obese and 11.6% for ultra-obese). Lumbar back pain was additionally predicted by smoking status (OR 1.6 to 2.9). Encouragingly, exercise both mitigates and modulates these risks. In the overall model the effect of exercise is most marked in the overweight, obese and ultra-obese groups.

BMP associated with lumbar plexus deficit

■ One of the major indications for recombinant BMP has been in the spinal surgical market. BMPs are frequently used to augment spinal fusions. There has been some concern that the occasional exuberant bone formation associated with BMP implantation may result in neurological compromise around the spinal cord and nerve roots. Although there is widespread usage of BMPs in this setting, there is a dearth of evidence to inform the spinal surgeon about the risks (or otherwise) of BMP-2 in lumbar spinal surgery. Surgeons in **New York (USA)**, having their suspicions raised, set out to establish if lateral lumber fusion and BMP-2 is associated with a higher rate of neurological injury than in lateral lumbar fusion alone. The study team conducted a retrospective case-matched comparison series (Level III

evidence) with the aim of establishing the incidence of neurological compromise in each group. The study team reviewed case notes for patients operated over a six-year period with at least six months of follow-up. The 72 cases where rhBMP-2 was used to augment the fixation were case matched according to demographic factors, surgical levels and body mass index. There were relatively high rates of neurological deficit, with around 50% of patients in each group complaining of a sensory or motor deficit. There were no differences between subgroups with regards to sensory deficit either post-operatively or at final follow-up. However, a higher rate of persistent motor deficit was seen in patients treated with rhBMP-2 (OR = 3.06). There was also a significantly higher incidence of recalcitrant thigh/groin pain (8 patients vs 0).[8] It certainly seems, based on these results, that rhBMP-2 may be a mixed blessing. With concerns raised about higher rates of post-operative deficit and persistent post-operative pain which were significantly higher in patients treated with rhBMP-2, for the time being at least here at *360* we will be staying well clear of it.

Just how common is back pain?

Back pain is one of the largest health economic burdens on western society but is almost unheard of in developing nations. The precise burden posed by back pain per se rather than presentation to spinal services is, however, not completely clear. Researchers in **Aberdeen (UK)** took it upon themselves to try and quantify the problem. Using a cross-sectional population study methodology, they aimed to establish the frequency of consultation to family doctors and the disability associated with lumbar back pain. The research team included 15 272 persons, all aged 25 years and older. The period prevalence was a staggering 28.5%, peaking in the over 40s. Surprisingly, older patients were more likely to seek medical consultations, and observed management patterns did differ with age. General practitioners were more likely to prescribe analgesics in the older population and less likely to refer to secondary care or physiotherapy (OR 0.63).[9] This study clearly demonstrates inequalities in the management of lower back pain and the high prevalence seen in western societies. The burden of disease is much higher than we had expected and demonstrates the importance of this kind of epidemiological study.

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