

the composite scores increased by the MCID in around half of patients, the component scores varied, with just 20% of patients exceeding the MCID in forward flexion. The authors make a valid point concerning the need to reach the MCID. However, although just 50% of patients reached the MCID in this series, it is clear from previous methodology papers that the MCID should be taken for the overall score, not the subcomponents.

### Superobesity and shoulder arthroplasty

■ The term 'superobese' is a relatively new one, and is usually taken to refer to patients with a BMI of 50+. However, as the incidence of obesity is increasing, more and more patients are presenting in the various stages of obesity, including 'superobese'. Other than the subjective heart sink surgeons feel when dealing with patients with a

large soft-tissue envelope due to the increasing technical difficulty of the surgery, there may well be also some specific risks of surgery to the superobese. Researchers in **Charlottesville (USA)** undertook a database study using the Pearl-Diver database to establish what the perceived effect of superobesity was on complications following shoulder arthroplasty.<sup>8</sup> As would be expected, there were a large number of patients included in this study. The results of 144 239 patients, including 23 864 obese, 13 759 morbidly obese and 955 superobese patients, were reported. The study team was able to identify a significantly higher rate of major complications (including infection, dislocation, loosening, revision, VTE and medical complications) following shoulder arthroplasty in the superobese group. This paper outlines some early experience with

this group of patients, and should inform surgeons and primary care physicians of the risks that obese patients face when undergoing shoulder arthroplasty surgery. Given that this group of patients is not going to disappear, it may be wise to examine measures to reduce complications and optimise outcomes while superobesity is still a rarity.

### REFERENCES

1. **Menendez ME, Baker DK, Oladeji LO, et al.** Psychological distress is associated with greater perceived disability and pain in patients presenting to a shoulder clinic. *J Bone Joint Surg [Am]* 2015;97-A:1999-2003.
2. **Whelan DB, Kletke SN, Schemitsch G, Chahal J.** Immobilization in external rotation versus internal rotation after primary anterior shoulder dislocation: a meta-analysis of randomized controlled trials. *Am J Sports Med* 2016;44:521-532.
3. **Murray DJ, Javed S, Jain N, Kemp S, Watts AC.** Platelet-rich-plasma injections in treating

lateral epicondylitis: a review of the recent evidence. *J Hand Microsurg* 2015;7:320-325.

4. **Yang CC, Lu CL, Wu CH, et al.** Stress analysis of glenoid component in design of reverse shoulder prosthesis using finite element method. *J Shoulder Elbow Surg* 2013;22:932-939.
5. **Zhang J, Yongpravat C, Kim HM, et al.** Glenoid articular conformity affects stress distributions in total shoulder arthroplasty. *J Shoulder Elbow Surg* 2013;22:350-356.
6. **Tashjian RZ, Granger EK, Farnham JM, Cannon-Albright LA, Teerlink CC.** Genome-wide association study for rotator cuff tears identifies two significant single-nucleotide polymorphisms. *J Shoulder Elbow Surg* 2016;25:174-179.
7. **Torrens C, Guirro P, Santana F.** The minimal clinically important difference for function and strength in patients undergoing reverse shoulder arthroplasty. *J Shoulder Elbow Surg* 2016;25:262-268.
8. **Werner BC, Burrus MT, Browne JA, Brockmeier SF.** Superobesity (body mass index >50 kg/m<sup>2</sup>) and complications after total shoulder arthroplasty: an incremental effect of increasing body mass index. *J Shoulder Elbow Surg* 2015;24:1868-1875.

## Spine

**X-ref** For other Roundups in this issue that cross-reference with Spine see: **Children's Orthopaedics Roundup 1; Research Roundup 6.**

### Shared decision-making in scoliosis surgery X-ref

■ Shared decision-making is a wholly unorthopaedic approach in many healthcare institutions. However, it is crucially important in everything from patient satisfaction through to medicolegal defensiveness. There are few more complex settings in which to attempt to achieve this than in spinal neuromuscular scoliosis surgery. The combination of complex decision-making, involvement usually of caregivers and a complicated risk benefit balance can make achieving a satisfactory decision rather difficult. Using a novel approach, spinal surgeons in **Jacksonville (USA)** report their efforts to apply a decision-making aid to this process.<sup>1</sup> Their study reports the development of a decision

aid using a multistep process of expert summation of current evidence, involvement of a multidisciplinary group and assessment against agreed decision aid standards. The aid was then utilised in a prospective fashion on 11 children, nine of whom opted for surgery following the process. The authors were able to report improvements in knowledge gain, satisfaction and decisional conflict by the caregivers in this particular setting. They conclude that the aid itself is a success and encourage the development of additional decision aids for other similar diagnoses.

### Diabetes and outcomes in spinal surgery

■ Diabetes is associated with almost every complication imaginable, and diabetics come to accept that the nature of their metabolic disorder is such that complications are associated with simple surgery, and almost every organ is affected.

Whilst there has been a reasonable focus on the effects of diabetes in terms of outcomes, there is little in the way of longer-term research establishing the effect (or otherwise) on surgical spinal outcomes. A study team from **Nashville (USA)** set out to evaluate the effect of diabetes in terms of outcome measures on a whopping cohort of 1005 patients, all having undergone elective spinal surgery.<sup>2</sup> Outcomes were assessed at one and two years using general quality of life measures (SF12 and EQ-5D) as well as disease-specific outcomes (Oswestry Disability Index). The cohort had 434 diabetic patients, and these had lower SF-12, ED-5D and poorer Oswestry disability scores. Even when looking at improvement in disability, the diabetic patients didn't fare as well as their non-diabetic control group. The diabetic patients did however make substantial improvements in both

quality of life and disability scores. Whilst diabetic patients in this series do not fare as well as their normal counterparts, and that in itself is important information, they do still make substantial improvements following spinal surgery and it is certainly possible that the restriction in improvement of outcome scores is due to other sequelae of diabetes.

### Scoliosis combined or posterior approach?

■ There is some controversy about the use of the combined anterior-posterior approach in treating idiopathic scoliosis. Whilst the plain posterior approach has the obvious benefits of operative time, reduced blood loss, and no need to turn the patient, the correction achieved may not be as effective and therefore longer-term outcomes may be compromised. We would draw readers' attention to this comprehensive review from

**Guangzhou (China)** which aimed to establish what the current state of play with regards to the evidence.<sup>3</sup> Although they were unable to find any randomised controlled trials, there were ten studies reporting the outcomes of 872 patients suitable for inclusion in the study. Unpicking the analysis, it appears that there were no differences in the overall achieved correction of Cobb angle between either approach, or respiratory function (predicated FEV<sub>1</sub>). However, when looking at some of the subgroups, there were differences in the achieved release between the two approaches in the more severely-affected patients. The kyphosis angle was significantly improved in the severe group who had an anterior approach, as opposed to those who had a posterior approach alone. There were however a few advantages in favour of the posterior alone approach in the less severe patients – fewer complications, better achieved respiratory function and lower blood loss. The data strongly supports the posterior-only approach in all but the most severe of corrections, as it is possible to achieve similar coronal plane correction and percent-predicted FEV<sub>1</sub> compared to combined anterior–posterior approach, and even does better in sagittal correction in severe AIS patients and is associated with less morbidity.

#### Reducing C<sub>5</sub> palsy

■ Every once in a while a simple paper with a superb message comes across the editorial desks at 360. The message in this paper from **Osaka (Japan)** is incredibly simple.<sup>4</sup> Nerve root damage during laminoplasty is likely caused by thermal damage, and using cooled irrigation reduces the incidence. In their comparative case series, the authors describe the outcomes of 800 patients all undergoing cervical laminoplasty. The first 400 patients underwent irrigation with room temperature saline and the second 400 with chilled (12°) saline. The outcomes were assessed in terms of upper

limb muscle power. There was a significant decrease in the incidence of upper limb palsy (from 5.5% to 1%). Further analysis of the results with a multivariate model suggested that the other contributing factors were the side of decompression, performing a foraminotomy and the use of the room temperature saline. This is an incredibly simple, but game-changing paper. Clearly chilled irrigation is safer.

#### Managing malpositioned lumbosacral pedicle screws

■ Whilst now almost universally ubiquitous, pedicle screws do have their drawbacks. Malpositioned screws can be terribly difficult to manage, with serious complications including neurological and vascular injuries. Very little is known about the best way to manage misplaced pedicle screws – and in the heat of the moment a variety of different strategies have been employed – some well-thought through and others less so.

■ A research team in **Hangzhou (China)** has described a simple and rapid method to decide if revision surgery is needed in patients with a misplaced pedicle screw.<sup>5</sup> The team based their study on 316 patients all undergoing lumbosacral pedicle screw fixation over a two-year period. The authors describe the use of their post-operative revision score for pedicle screw malpositioning (PRSPSM). In their series, a threshold of 5 was appropriate for revision surgery, and removal/repositioning of the screw. The authors recommend that serial measurements post-operatively are appropriate and as such they were able to identify five patients early requiring revision surgery, whilst ten patients with an initially elevated score (but less than 5) all went on to make a recovery with conservative treatment. This is a nice succinct paper that highlights that not all malpositioned pedicle screws need to be revised, and gives an easy score and set of criteria on

which to ‘hang your hat’ when making that tricky decision.

#### Improving spinal nerve root imaging: diffusion tensor scanning X-ref

■ The MRI scan has revolutionised the evaluation of spinal pathology. As a ‘no radiation’ scan, with the ability to visualise the soft tissue pathology in the spinal canal, it is now gold standard. There are however a few problems, the false positive rate can be as high as 30%, and so clinical correlation is still key to successful surgical outcomes.

Diffusion tensor imaging (dMRI) is an MRI technique that uses the diffusion patterns of water to detect abnormalities in soft tissues. dMRI has been in common use in stroke management and was developed in the mid-1980s. It is

somewhat surprising then that dMRI has not found application in spinal pathology. Researchers from **Chiba (Japan)** present the first series, although small, of the application of this technology to 13 patients, all with a symptomatic disc prolapse.<sup>6</sup> Their diagnostic paper considers the imaging results of these patients obtained on a 1.5T MRI scanner with dMRI imaging and attempts to establish what the changes in specific diffusion parameters were (fractional anisotropy (FA) and apparent diffusion coefficient (ADC)). Scans were taken both at presentation and six months following surgery, with the imaging findings correlated to the reported symptomatology. The authors established that the FA values significantly decreased and the ADC values significantly increased in compressed nerve roots and that there were strong correlations between reported symptoms and the dMRI findings. It does appear

that the flexibility offered by dMRI may allow for better understanding of imaging findings, and perhaps in the future increase the specificity of MRI scanning as a diagnostic modality.

#### Cervical myelopathy and PLL ossification

■ Getting a handle on exactly what is meant by cervical myelopathy can be challenging. Like many umbrella terms, degenerative cervical myelopathy is a broad church covering a variety of pathologies. The range of pathologies includes

spondylotic changes as well as PLL thickening and ossification. An international study team from **Canada, Japan, USA and China** coordinated as part of the AO Foundation asked the question: is surgery equally effective and safe in patients

with PLL ossifications as it is in other pathologies relating to cervical myelopathy? Their study included the outcomes of 479 patients all with symptomatic cervical myelopathy enrolled at 16 international sites to take part in this prospective study. The study reports comparative surgical outcomes between those patients with ossification of the PLL and those without. Outcomes were reported with clinical outcome scores and the SF-36 quality of life scores. The groups were unsurprisingly unequal, with 135 patients presenting with radiographic evidence of PLL ossification and 344 without. There were no significant differences however in patient demographics or baseline disease severity between the two groups. At the final reported two-year follow-up, there were no differences in functional outcomes or quality of life scores between any of the outcome measures recorded.



The authors raise a slight note of caution with a non-significant difference in complication rates with a higher rate of complications in the PLL ossification group. It seems from the data presented here that surgical decompression of cervical myelopathy secondary to PLL ossification is as successful as for any other cause, but caution should be exercised with regards to complications.

## REFERENCES

1. Shirley E, Bejarano C, Clay C, Fuzzell L, Leonard S, Wysocki T. Helping families make difficult choices: creation and implementation of a decision aid for neuromuscular scoliosis surgery. *J Pediatr Orthop* 2015;35:831-837.
2. Armaghani SJ, Archer KR, Rolfe R, Demaio DN, Devin CJ. Diabetes is related to worse patient-reported outcomes at two years following spine surgery. *J Bone Joint Surg [Am]* 2016;98:15-22.
3. Chen Z, Rong L. Comparison of combined anterior-posterior approach versus posterior-only approach in treating adolescent idiopathic scoliosis: a meta-analysis. *Eur Spine J* 2016;25:363-371.
4. Takenaka S, Hosono N, Mukai Y, Tateishi K, Fuji T. Significant reduction in the incidence of C5 palsy after cervical laminoplasty using chilled irrigation water. *Bone Joint J* 2016;98-B:117-224.
5. Du JY, Wu JS, Wen ZQ, Lin XJ. Treatment strategies for early neurological deficits related to

malpositioned pedicle screws in the lumbosacral canal: a pilot study. *Bone Joint Res* 2016;5:46-51.

6. Eguchi Y, Oikawa Y, Suzuki M, et al. Diffusion tensorimaging of radiculopathy in patients with lumbar disc herniation: preliminary results. *Bone Joint J* 2016;98-B:387-94.
7. Nakashima H, Tetreault L, Nagoshi N, et al. Comparison of outcomes of surgical treatment for ossification of the posterior longitudinal ligament versus other forms of degenerative cervical myelopathy. *J Bone Joint Surg [Am]* 2016;98:370-78.

## Trauma

**X-ref** For other Roundups in this issue that cross-reference with Trauma see: [Hip & Pelvis Roundup 1, 2, 8](#); [Knee Roundup 6](#); [Foot & Ankle Roundup 6](#); [Research Roundup 7, 9](#).

### Taper slip hemiarthroplasty for hip fracture X-ref

■ The hip fracture burden continues to rise, and as patients are becoming younger and younger, increasing attention is being paid to their functional demands. With many patients now receiving total hip arthroplasties, we were delighted here at 360 to read this paper concerning a modern hemiarthroplasty. Researchers in **Peterborough (UK)** report their retrospective evaluation of the largest consecutive series of the Exeter trauma stem.<sup>1</sup> Patients were aged on average 81 years old, with a follow-up to 4.1 years (2 to 7). All patients were clinically followed up at six weeks with radiographs, then again at 12 months, with telephone consultations in the interim. Longer-term data were obtained from further telephone consultations, GP input and mortality statistics. Although 63% died during the follow-up period, as might be expected, only six of the survivors were lost to follow-up, making this an impressively robust report within the confines of a retrospective analysis. Of these patients, 24 ultimately required further surgery for implant-related complications, and at final

follow-up, 71% of patients were living in their own home, and 42% were independently mobile with no need for walking aids, and had a low mean pain score of 1.6. At a time when choice of implant for intracapsular neck of femur fracture remains somewhat controversial, it is refreshing to see a study of a contemporary hemiarthroplasty prosthesis reporting excellent patient survivorship, favourable complication rates and good symptomatic and functional outcomes. Given the widespread popularity of the Exeter total hip arthroplasty, it is perhaps surprising that the equivalent hemiarthroplasty has gained relatively little international recognition; this study may potentially help to redress this.

### Occult hip fractures X-ref

■ In the vast majority of cases, plain radiography is sufficient to diagnose a hip fracture in the elderly population. However, on occasion there may be strong suspicion of a hip fracture, but no obvious fracture on plain radiographs. Although plain radiography remains the first line of investigation for a hip fracture, both CT and MRI have their own potential advantages as a second line investigation. A study team based in **Mölnadal (Sweden)** have set out to shed some light on the relative diagnostic accuracy of MRI and CT in diagnosing occult and suspected hip fractures in elderly patients.<sup>2</sup> A group

of 44 patients, all with low-energy trauma to the hip and inconclusive plain radiographs, were entered into the study. All patients then had an initial CT and a subsequent MRI scan. Of the 44 patients who had an MRI, 27 cases (61%) had their diagnosis changed from the CT scan diagnosis. The authors conclude that MRI was more reliable than CT in the diagnosis of hip fractures, and that a negative CT report cannot completely rule out a hip fracture. It is well recognised that delaying surgery in an elderly patient who has sustained a hip fracture following a fall carries a higher risk for potential morbidity such as a chest infection, skin breakdown over pressure areas and mortality. This paper highlights the need to ensure that MRI scanning is available when needed to determine a definitive diagnosis following equivocal plain films.

### Distal femoral fixation: to lock or not to lock?

■ The advent of the Less Invasive Stabilisation System (LISS) and its subsequent involvement into the various distal femoral locking plates has added a new option to the weaponry of the surgeon dealing with periprosthetic fractures and low distal femoral fractures about the knee. The superior primary hold afforded by the original LISS system was met with enthusiastic uptake by the trauma community.

However, the initial stiffness in the design resulted in an increasing rate of nonunion and metalwork failure, presenting a different problem over the traditional methods. Realising that there was a potential trade-off between traditional fixation (where fixation failure was common) and LISS fixation (where nonunion and implant fatigue can occur), the **Canadian Orthopaedic Trauma Association (Canada)** report their RCT comparing the rates of fracture healing and union between the traditional dynamic condylar screw (DCS) and newer LISS plate.<sup>3</sup> The study reports the results of 52 patients, all presenting with distal femoral fractures of all subtypes, enrolled at seven Canadian level 1 trauma centres. Patients were randomised to treatment with either the locked Less Invasive Stabilisation System or the dynamic condylar screw with the primary outcome of fracture union at 12 months. Secondary outcomes reported included post-operative function and complications. Perhaps unsurprisingly, there were no statistically significant differences between the LISS and the DCS in terms of the number of fractures healed, time to union, or functional scores. Complications and revisions were more common in the LISS group, with seven re-operations in the LISS group compared with one in the DCS group. While 91% of the