

of nonunion (81% vs 96%). In contrast to the perceived wisdom, immediate mobilisation does not offer poorer long-term outcomes. It certainly offers more rapid mobilisation and a greater external rotation arc at the trade-off of lesser tuberosity union rates and internal rotation arc. Either approach would seem to be perfectly acceptable but the more rapid return to function has the edge for us here at 360.

Glenoid version in shoulder dislocation X-ref

■ Given the focus in recent years on glenoid version in adult reconstruction and outcomes, it is surprising that there has been little in terms of investigation into the effects of glenoid version on shoulder dislocation rates in native shoulders. We were delighted to see this

cross-sectional study from a team based in **Bolu (Turkey)**,⁷ aiming to establish the potential link between glenoid anteversion and anterior shoulder dislocation. Although the potential for a link seems obvious, there has previously not been a suitable study to establish this one way or the other. The authors report a comparative case series evaluating the glenoid geometry of 63 patients with one or more anterior shoulder dislocations and a comparator control group of 63 individuals with no shoulder pathology or signs of instability. The study reports the glenoid version angle using an axial CT cut. Interestingly (although possibly not surprisingly), the investigators established that there were significantly higher version rates in the dislocation group when

compared with the non-dislocation group. There was, however, no demonstrable relationship between mechanism of dislocation and other factors such as glenoid version angle and number of dislocations. It is reasonable to conclude that glenoid anteversion predisposes to, but does not cause, dislocation in the shoulder.

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Spine

X-ref For other Roundups in this issue that cross-reference with Spine see: **Oncology Roundup 6; Research Roundup 5.**

How accurate is the MRI Scan?

■ MRI scans are seen in many areas of orthopaedic practice as a “gold standard” diagnostic modality. However, because the MRI has become a basic healthcare “commodity”, we tend to forget that there may be meaningful differences in quality. Scan acquisition location is sometimes determined by patient choice and scans are increasingly used in primary care to screen patients. These scans are sometimes used to determine the need for specialist referrals, particularly in the UK and US. The accuracy of the radiologist’s report in this setting is of paramount importance, as the images themselves will often not be reviewed by the requesting professional who may be a non-specialist primary care physician or physiotherapist. The authors of this study from **New York, New**

York (USA),¹ who are not specialist spine radiologists, set out to investigate the variability in “interpretive findings” by accredited radiologists in their region around New York City. A single patient with back and L5 radicular symptoms underwent scanning in ten different imaging centres and the reports produced were compared with a “gold standard” consensus report by the authors. There was a large variability in reporting, with 49 distinct findings recorded. None of these 49 findings were unanimously reported across all ten reports, and only one finding (an anterolisthesis at L5-S1) was reported in nine out of ten exams. A Fleiss’ Kappa statistic was used to assess inter-rater agreement (1.0 indicating perfect agreement and 0 or less indicating agreement no better than chance). The overall Fleiss’ Kappa statistic across all ten exams was 0.20 ± 0.03 indicating poor agreement. Most spine specialists in secondary care will be able to review and interpret the imaging themselves. They will

also have access to radiologists with whom to query reports in addition to correlation with clinical findings and the history they have taken. However, this is not the case in primary care, and this study has huge implications for musculoskeletal interface or triage services, whose role is to screen referrals to secondary care, especially if there is an (over)reliance on the MRI report itself. The authors state that an incorrect MRI diagnosis has the potential to delay appropriate care, which in turn can have a negative impact on patient, outcomes and costs.

Dural tears an economic and clinical disaster?

■ Complications are the fear of every spinal surgical patient and their surgeon. Although dural tears and dural leaks can be innocent, they are relatively common complications that can be incredibly serious. Incidental, inadvertent dural tears occur in up to 20% of lumbar spine cases. Dural repair can be straightforward

with only a slight increase in operative time and is thought to reduce the incidence of post-operative complications. However, these complications still occur, and can include associated neurological injury, headaches and electrolyte disturbance. The negative consequences though are often seen in the post-operative period and investigators in **Charlottesville, Virginia (USA)**,² set out to quantify the economic and medical effects of dural injury in an elderly population undergoing primary lumbar discectomy. A cohort of 41 655 patients, all of whom were older and undergoing lumbar discectomy, were included in the study. The patient cohort was assembled using Medicare Insurance data and two groups were compared: those who had an incidental dural tear and those who did not. A dural tear rate of almost 5% was recorded which probably reflects the increased incidence in the older patient with degenerative stenotic spines. The results were striking: there were greater rates of wound

infection (2.4 vs 1.3%, $p < 0.001$) and wound dehiscence (0.9 vs 0.4%, $p = 0.004$), increased rates of 30-day re-admission (7.2 vs 3.8%, $p < 0.0001$), and in-hospital costs increased by \$4000, representing a 66% cost increase in those patients with an inadvertent dural injury. In the longer term, re-operation rates and outcomes (SF-36) are identical following durotomy,³ but clinicians should be aware of these short-term consequences, which are anything but benign and incur significant increases in healthcare costs, and patients should be counselled accordingly.

ALIF: is an access surgeon needed?

■ Anterior-approach spinal surgery, and in particular anterior lumbar interbody fusion (ALIF), is enjoying a renaissance. Although the approach is often foreign territory to the spinal surgeon, the ability to use larger interbody cages with the associated better sagittal profile correction and biomechanical advantages certainly has its allure. The approach may be unfamiliar to younger spine surgeons and coupled with increasing medical litigation, there is a trend towards the use of the “access” surgeon - often a vascular surgeon - to perform the exposure to the front of the spine. For the practising spine surgeon, the dilemma is whether they would be subsequently criticised if they had a complication and chose not to use an access surgeon. The authors of this study have performed a systematic review and meta-analysis to compare outcomes and complications with and without a vascular surgeon, the assumption being that the complication rate would be lower with an access surgeon. A review team from **Sydney (Australia)**⁴ undertook a comprehensive literature review and meta-analysis. The study team were able to identify 58 reports to include in the meta-analysis, reporting the outcomes of just over 8000 patients. The overall rate of intra-operative complications was broadly similar between the two groups both with and without



an access surgeon. However, the pooled rate of arterial injuries (0.44% vs 1.16%, $p < 0.001$), retrograde ejaculation (0.41% vs 0.96%, $p = 0.005$) and ileus (1.93% vs 2.26%, $p < 0.001$) was greater with an access surgeon. Conversely, the pooled rates of peritoneal injuries (0.44% vs 0.16%, $p < 0.034$), neurological injury (0.99% vs 0.11%, $p < 0.001$), prosthesis complications (1.59% vs 0.89%, $p < 0.001$), re-operation rates (2.28% vs 1.31%, $p < 0.001$) and total post-operative complications (5.95% vs 4.08%, $p < 0.001$) were lower with an access surgeon. So, what does this all mean for the practising spine surgeon? The intra-operative complication profile is broadly similar and so they will have to weigh up their individual experience, the patient's anatomy and the ease of access to a vascular surgeon peri-operatively in deciding whether to use an access surgeon or not. There is of course one significant ‘rider’ to apply in the interpretation of this study – the more difficult the access and the more risky the surgery, the more likely a spinal consultant is to turn to an access surgeon, making selection bias a clear potential problem here.

Magnetic growth rods and MRI scans

■ Magnetically controlled growing rods are being used to treat early onset scoliosis in many units up and down the country. The growing rods utilise magnetic inductance to control their growth, and clearly there is the potential for environmental magnetic stimuli to interfere with the

process. Perhaps most pertinently, as this patient group often requires serial MRIs to monitor and assess their brain and spinal cord, the safety in an MRI scanner is key. The problem posed is that this imaging modality creates a magnetic field and the implanted device responds to and lengthens to a magnetic field, and so MRI is not recommended in this patient group. This said, a group in **Los Angeles, California (USA)**⁵ have set out with the aid of the Children's Spine Study group to establish the safety of growing rods across their membership in light of a previous *in vitro* study showing that magnetic rods are not triggered by the MRI.⁶ Within the context of an international focus group of clinicians, their paper reports no deleterious effects in ten patients with growing rods who underwent MRI scanning (presumably inadvertently) and suffered no loss of rod fixation, unintended lengthening or overheating. Whilst interpretation of the imaging adjacent to the implant was limited by artefact, the imaging of non-adjacent areas (such as the cervical spine) was unaffected and “clinically useful”, and so the group suggests that based on these data MRIs should not be contraindicated.

Should we electively operate in the frail spinal patient?

■ A total of 10% of all older adults in the UK are frail, a rate which rises to over 40% in surgical patients. However, with advances in preventative medicine and improved therapies, frail patients and have rising expectations. The older patient now demands a higher quality of life that many of our treatments can offer. What impact does frailty have on the efficacy of spinal surgery? A study from **Vancouver (Canada)**⁷ aimed to assess the impact of frailty on common post-operative complications, mortality rates and discharge destination in patients over the age of 65 years. The authors utilised data collected from the American College of Surgeons National Surgical Quality Improvement Programme

Database which included 53 080 suitable patients. Of these, 2041 patients were defined as frail (4%). Taking into account the frailty of the patients themselves and the nature and difficulty of the procedure, the authors were able to calculate the relative risks of complications. The authors describe that for every 0.1 increase in the reported Modified Frailty Index (MFI), the risk of major complications increased by OR 1.15, infection by OR 1.15, mortality within 30 days by 1.44 and a longer length of stay with an increased chance of discharge to supported living facilities. The authors also evaluated the ASA as a possible predictor of complications, however, they went on to show that the MFI is better than the ASA at predicting these outcomes. Although it stands to reason that frailer patients will encounter more difficulties in the post-operative phase, this is the first paper we are aware of at 360 to put some numbers to this particular problem in the spinal patient. We should be very careful when counselling frail patients about the risks of their surgery, and we should consider the significantly increased risks of complications when taking on this kind of surgery in frailer patients.

Embolisation in spinal tumours: not just for renal cell?

■ Ask an orthopaedic trainee to name the tumours that need embolisation pre-operatively and they will undoubtedly say ‘renal cell’, and if you're asking a medal winner, perhaps ‘thyroid’. But what about other solid lesions? Symptomatic spinal metastases are found in up to 10% of patients with malignancy, so even outside cord compression they're a common problem. Surgery in these cases can be complicated by the vascularity of the lesion, which, if left unchecked, can lead to significant morbidity and make a difficult operation harder. Embolisation has the potential to shrink tumours and reduce bleeding if carried out pre-operatively.

Aside from the oft-described renal and thyroid tumours, a study from **Singapore (Singapore)**⁸ reports the outcomes of 218 cases, all with solid spinal metastases. The study reports operative blood loss and length of stay in hospital. Forty-five patients underwent embolisation for either highly vascularised (renal, thyroid, hepatocellular), moderately vascularised (lung, breast, prostate, colon, nasopharyngeal, cervical and epithelial tumours) or haematological malignancies (myeloma, lymphoma). Embolisation only resulted in two complications (pain) overall, however, the study team were unable to find any significant differences in bleeding or length of stay between the embolised and standard groups. On the other hand, there was a reduced length of stay in the moderately vascular tumours. These differences persisted when level of surgery and number of instrumented levels were included in a multivariate analysis. The findings of this study certainly go against the accepted wisdom. Embolisation was found in this series to be most effective if surgery was performed within 24 hours post procedure, so this study is unlikely to change practice (especially in light of the requirements for more

work). It does, however, suggest that in the case of urgent surgery being required, waiting for embolisation may not be necessary for a reasonable outcome, perhaps saving our patients hours or days of pain and suffering.

Halo or screw? X-ref

■ For the elderly patients who fall and fracture their odontoid peg, there really are few good treatment options. In the majority of centres, the surgical team have a tricky decision to make between a halo vest with all its attendant longer-term woes or screw fixation of the peg, with all the intra-operative risks. The balancing act here is between the halo vest which is undoubtedly safer, but has an increased risk of nonunion in type 2 fractures. To help unpick this difficult decision, a group from **Vienna (Austria)**⁹ have compared the union rates and mortality of halo vest with screw fixation for type 2 odontoid peg fractures. Their study was database-driven and included patients aged 65 years and over with an ASA of 2 or greater. The team were able to report the outcomes of 80 patients, each with a minimum of five-year follow-up. There was no difference in mortality rates between

the two treatments, however, there were just seven deaths overall. What was striking were the differences in nonunion rates. The investigators identified that 10% of those with screw fixation went on to nonunion compared with 23% with halo vest immobilisation. Those treated with screw fixation showed less severe pain, less functional disability and less psychological stress. However, no difference in physical symptoms was found when patients were asked directly, despite the difference in nonunion rates. Overall, patients with screw fixation did better, both in terms of complications and physical symptoms. This study shows that screw fixation wins the battle in this selected patient group and despite our inherent reservations, we should give more consideration to using this technique in our older adult patients.

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Trauma

X-ref For other Roundups in this issue that cross-reference with Trauma see: *Knee Roundup 5; Foot & Ankle Roundup 3, 4 and 6; Wrist & Hand Roundup 5; Shoulder & Elbow Roundups 2, 3, 4 and 7; Spine Roundup 7; Oncology Roundups 3 and 7; Children's orthopaedics 1 and 4; Research Roundup 7.*

How good is good enough in the shoulder? X-ref

■ Recent studies, including the PROFHER (Proximal Fracture of the Humerus Evaluation by Randomization) study,¹ have questioned the

usefulness of open reduction and internal fixation of proximal humeral fractures. However, we know that randomised controlled trials are only as good as their design and reporting. With a dichotomous intervention it is only possible to conclude from such a study that on average, given the choice of one intervention for all of the included cases, which treatment will do best. Of course, as surgeons we like to think that the quality of our surgery has an effect upon outcomes, and intuitively this is correct, with poor surgery often

leading to complications. The effect on outcomes, however, is not such a clear link. Authors from **Ludwigshafen am Rhein (Germany)**² have set out to identify the benefit of accurate fracture reduction on outcomes in the proximal humerus. Their study of 98 patients, all with proximal humeral fractures of the anatomical neck (type C according to the OTA/AO classification system), sought to establish whether there was any determinable prognostication from fracture reduction and reduction quality, fracture pattern,

and patient-related factors. Outcomes were assessed using age- and sex-adjusted Constant score (CS%) in combination with the DASH score. Fracture reduction was assessed through determining head-shaft displacement, head-shaft alignment, and cranialisation of the greater tuberosity. Anatomical or acceptable fracture reduction was achieved in 40 (40.8%) of the patients. Patients with an anatomic or acceptable fracture reduction had a significantly lower complication rate (20.0% vs 41.4%) and a lower revision rate