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

(20% *vs* 32.8%), as well as better clinical outcome (mean CS% of 65.4% *vs* 47.6%). Cranialisation of the greater tuberosity > 5 mm (n = 25), head-shaft displacement of > 5 mm (n = 50), and valgus head-shaft alignment (n = 12) all increased the relative risk two- to threefold for inferior clinical outcome. Anatomical fracture reduction with a locked plate significantly improved the clinical outcome of unstable and displaced proximal humeral fractures involving the anatomical neck.

Suprapatellar nailing better in the distal tibia?

■ In recent years, the use of the suprapatellar insertion technique for intramedullary nailing has been somewhat in vogue. The more natural positioning of the tibia with the knee in semi- extension resulted in an initial promotion of semi-extended nailing for proximal third tibial fractures, in which the extended knee position allows easier and more accurate alignment; the position tends to neutralise the procurvatum deformity seen with the pull of the quads tendon. These authors from across the **United States**[3,4] have looked to establish whether there is any potential advantage in the management of distal tibial fractures with suprapatella nailing. The authors have undertaken a retrospective cohort study using their series of tibial fractures. They have compared the immediate post-operative alignment of 266 distal tibial fractures (fractures within 5 cm of the tibial plafond), all of which were treated with an intramedullary nail inserted using either a suprapatellar or infrapatellar technique. The outcomes assessed were primary angular malalignment, defined as ≥ 5° on the post-operative radiograph. In their series, malalignment occurred in 26.1% of patients treated with an infrapatellar insertion technique compared with only 3.8% in patients treated with a suprapatellar insertion technique. Unsurprisingly, this was a significant difference. The rates of an intact fibula and fibular fixation were not significantly

different between the two groups. The authors concluded that there is a significantly lower rate of malalignment in distal tibial fractures treated using the suprapatellar technique. Whilst this difference is marked, we were slightly confused about the potential aetiology and about the quality of the infrapatellar nailing. Previous reports in the literature would suggest malalignment rates of around 2% and malunion rates of around 3% in distal tibial fractures.

Adolescent distal humeral fractures X-ref

■ Distal humeral fractures in the paediatric population (as distinct from supracondylar fractures) are usually seen in the adolescent population and for lack of a firm evidence base are usually treated in a similar manner to their adult equivalents. An investigative team from **Honolulu, Hawaii (USA)**[5] have set out to add some evidence to inform current and future practice. Although this study is based on a retrospective review of just 31 patients, all with intra-articular distal humeral fractures, it does represent a large series for what is a rare injury. The study focuses on the clinical and radiographic outcomes of the included 31 consecutive adolescent patients surgically treated for acute distal humeral intra-articular fractures. The authors report functional outcomes in terms of Mayo elbow performance scores, DASH scores and the SF-36. Just nine patients returned for clinical review, making the objective outcomes fairly unreliable. However, of those who did return for review, a 120° composite arc of motion was recorded and, perhaps most worryingly, the notes review recorded peri-operative nerve palsies in around a third of patients, although all resolved by final follow-up. This fits with the reported picture of high numbers of complications (20 in 15 patients, of which 13 needed a return to the operating theatre). The authors concluded that one can expect no significant loss of motion or strength. However, the peri-operative complication rates are high and may be related to surgical approach and fracture pattern. Although the eventual outcome of these injuries in this series was satisfactory, the authors underline the severity of the injury and the difficulties that treatment entails.

Sliding hip screws in the younger patient X-ref

■ The surgical team in **Belfast (UK)**[6] are renowned amongst other things for their focus in quality improvement in hip surgery. Using their institutional database of 2201 hip fractures presenting over a three-year period, the authors identified 97 patients who had sustained a displaced intracapsular hip fracture under the age of 65 years. These represented just 4% of the whole cohort and were treated with a sliding hip screw (SHS). This study focuses on surgical complications as an endpoint and the authors report factors that may be associated with complications. They reported follow-up to an average of three years and had a 22% revision rate. In line with the rest of the older adult literature, around a third of patients developed avascular necrosis. In addition, the authors were able to establish that posterior comminution, chronic respiratory disease and leaving the fracture distracted were associated with revision to arthroplasty. Perhaps one of the most striking observations, given the young age of this patient group, was the loss of independence. Although these were clearly not a typical group of under 65 year olds, with 11% of patients requiring a walking aid prior to fracture, just 78% were able to walk unassisted outdoors after their injury. The authors conclude that, in this series of patients, fracture biology and revascularisation play a greater role than operation timing. We at 360 would add, that the results reported are surprisingly poor in terms of their failure to return to independent mobilisation. Certainly food for thought.

Locking screws: oversold in the distal tibia

■ Many innovations in orthopaedic trauma have appeared from thin air, with nothing more than 'it seems sensible' or surrogate outcomes in terms of company-sponsored biomechanical studies to support their use. Although this can often work out well, there are some fundamental pieces of technology that are not supported by any reasonable level of evidence. A trial team in **Cincinnati, Ohio (USA)**[7] has set out to establish how effective one of the most fundamental changes in treatment of Pilon fractures has been – the use of the locking plate. They designed their own level one study to establish the differences between locked and non-locked fixation of the distal tibia. The study team enrolled 60 patients in their study over a two-year period and randomised them to locked and non-locked plates. Sadly, only 34 were available at follow-up and there were no real differences seen in any outcome measures. There was a slightly higher failure rate of 3/19 in the non-locked group compared with 1/15 in the locked group which was non-significant. The authors found there to be no difference between the two constructs. Although an excellent start this cannot really be more than a pilot study.

Predicting pelvic haemorrhage

■ Major haemorrhage remains the leading cause of death following trauma, and in the orthopaedic trauma field this means major pelvic bleeding or vascular injury to the limb. Pelvic bleeding can be

torrential and whilst there are various algorithms for dealing with bleeding, once it is established with varying strengths of evidence to support their use, there is little in the way of predictive modelling to predict who would and who would not be likely to suffer from major pelvic fracture-associated bleeding. Authors from **Kochi (Japan)**[8] have investigated the risk factors for massive haemorrhage associated with pelvic ring bleeding. The authors constructed a retrospective approach to review all patients over 16 years of age with a pelvic ring injury with an AIS > = 3. Their cohort of 98 patients was split into massive haemorrhage (six units or more transfused) and regular patients. The authors used a multivariable model to establish that a high lactate level, extravasation of contrast on CT and instability of the pelvic fracture were all predictors of likely haemorrhage. Although it is clearly of limited clinical utility (let's face it, majorly haemorrhaging patients are usually relatively sick), as a total score the identification of the component parts as risk factors for haemorrhage is a significant step in the right direction and there is plenty of scope for hands-on use of this paper in the resuscitation room.

Lateral closing osteotomy for the treatment of cubitus varus X-ref

■ Although relatively rare in developed healthcare systems, the cubitus varus deformity is still the most common deformity following supracondylar fracture, and is much more common in neglected injuries. Authors from **Chongqing (China)**[9] have shared their considerable experience of the closing wedge osteotomy to correct this deformity. The authors describe the outcomes of their distal lateral isosceles triangle closing wedge osteotomy. Variations on the theme have been previously published, however, the authors describe a neat approach to make a closing osteotomy leaving the medial cortex intact using a pre-produced template. They fixed their osteotomies with simple K-wires and immobilised the patients in plaster for around six to eight weeks, depending on the appearance of callus on the radiographs. The authors followed this series of 25 patients until skeletal maturity and were able to report on their clinical and radiographic outcomes, with 23 achieving what the authors reported as an 'excellent' result. At final (average two years) follow-up, a single elbow required further surgery (following a fall) and the carrying angle on average was 11.7° (7° to 18°). The authors should be commended for what essentially amounts to a practical, effective, reliable, safe and simple method of correcting post-traumatic cubitus varus in children. It has inherent stability and excellent cosmesis without prominence of the lateral condyle.

Immediate total body CT scan for trauma? X-ref

■ In a very important RCT, researchers in **Amsterdam (The Netherlands)**[10] have asked questions about the logic of immediate total body CT scanning (the so-called traumagram). The majority of trauma networks and their attendant major trauma centres, along with the (often smaller) Level 1 trauma centres in the USA, have pushed hard for immediate total body CT scanning in the badly injured. The benefits are easy to see. Modern resuscitation bays are often co-located with CT scanning so there is no need to stop the lifesaving resuscitation, and rapid acquisition of a total body CT scan has some accompanying benefits with early diagnosis and accurate radiological secondary survey assured in the unconscious and difficult to assess patient. The risks, however, are also there. Total body CT carries a moderate dose of radiation, the effects of which are lifelong, and not clearly known (most data on radiation-induced tumours are extrapolated from Hiroshima and Chernobyl). The REACT-2 study aims to assess the risks and benefits of a CT scan in the shorter term. The study group designed a randomised controlled trial where patients were randomised in the resuscitation room to either immediate total body CT scan or standard of care (assessment with plain films and targeting imaging as per ATLS guidelines). The authors screened a remarkable 5475 patients for eligibility and included 1403 patients in the study (just over 700 in each arm). There was no difference in 'in-hospital' mortality between the two groups, at 16% in each. There were also no differences in subgroup analyses between those with poly-trauma or confirmed intracranial haemorrhage. Whilst this study could be considered another 'negative' no-difference study, it is an important negative. We know that CT-based imaging is harmful, and particularly in young patients there is little known about the potential longer-term side effects in terms of tumorigenesis. Here at *360*, we would recommend a pause for thought. The centres involved are all excellent trauma centres and, as such, the decision making surrounding the 'standard care' was excellent so this paper carries an important message – whole body CT can be avoided in patients if reviewed by a senior experienced surgeon on arrival.

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