Injections prior to rotator cuff repair are associated with increased rotator cuff revision rates

In a further article in this issue, and on the same topic, this group from **California (USA)** have also performed a separate 'big data' study of shoulder injection prior to rotator cuff repair.[8] Again, large national insurance databases were interrogated to provide the study cohort and a total of 22 000 patients who received ipsilateral shoulder injections prior to rotator cuff repair were included in the eventual analysis. These patients were then matched by age, sex, body mass index, smoking, and comorbidities to a matched group who underwent rotator cuff repair without prior injections. Revision rotator cuff repair was the endpoint studied. This study again echoes the finding that patients receiving corticosteroids prior to cuff repair are more likely to undergo revision surgery, and this occurred at an odds ratio of 1.52. Furthermore, these findings were time-dependent and patients receiving injections closer to the time of index surgery were more likely to undergo revisions. The effect was also cumulative, in that patients receiving two or more injections had a greater than two-fold increased risk at a combined odds ratio of 2.12. What really is impossible to say is what happens to those patients who have an injection and do not go on to surgery. If injections are obviating the need for surgery in some groups of patients, which even a few months in shoulder practice will convince the casual observer that they do, then the scale to which this effect might occur becomes important. If there is a significant improvement in these groups, such that subsequent surgery is avoided, then this is potentially a worthwhile pursuit, but if surgery is essentially inevitable for the majority, then these results cast doubt on how appropriate this practice may be. Regardless, surgeons would probably do well to observe the findings here both in terms of the dose effect and the duration of time to surgical intervention where the injection therapy fails.

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Spine

X-ref *For other Roundups in this issue that cross-reference with Spine see: Research Roundup 1.*

Odontoid process and mortality: can we use non-spinal scoring systems?

Contemporary research has suggested that fractures of the odontoid process are associated with mortality rates similar to those associated with hip fractures. However, while there has been much investment and publicity surrounding improvements in care for femoral neck fractures, such as a joint care model, medical interventions, and a best practice tariff, this is not true for fragility fractures of the odontoid process. This group from **Brighton (UK)** has sought to determine if the Nottingham Hip Fracture Score (NHFS) and the Sernbo score are as useful in predicting outcomes in patients with fractures of the odontoid process as they are in patients presenting with hip fracture.[1] The team undertook a retrospective study and reviewed the clinical records of patients aged 65 years and over who presented with fracture of the odontoid process at two hospitals. Every patient was managed with a semi-rigid cervical collar and data were evaluated to search for predictors of mortality at 30 days and one year. In all, 82 patients were identified, with a mean age of 83.7 years (67 to 100). The overall mortality across the cohort was in line with other recently published studies: 15% at 30 days and 34% at one year. Close interpretation of the data showed that the presence of a head injury and the NHFS assigned to the patient predicted mortality at both 30 days and one year. Further analysis showed that patients with an NHFS score greater than 5 had a significantly higher risk of mortality at both 30 days and one year. This cohort study shows that overall frailty is an important predictor of mortality in fractures of the odontoid process. The paper uses a pragmatic system for scoring a condition of frailty to see whether it applies to a similar condition. We suggest that this tactic could be used more regularly to avoid having to reinvent the wheel with other similar conditions, such as pubic ramus or subdural haematoma. Now that hip fractures are scored using a validated frailty score in addition to a prognostic score (usually the NHFS), we would like to see a comparison of these two approaches. Given the current climate of reducing overall spend on healthcare, it does seem that there may be an argument for these patients to be placed on a frailty pathway with a view to improving their overall outcomes, reducing dependency, and reducing overall healthcare spend.

Steroids in dysphagia following spinal surgery

Anterior cervical neck surgery is now routine in spinal practice, and the preamble to surgery should always include a discussion regarding the risk of dysphagia. Dysphagia and hoarseness are due to stretch, haematoma compression, or damage to the recurrent laryngeal nerve. The strategy for managing this problem revolves around adequate nutrition, as well as allowing the usual neurapraxia to resolve through conservative management. An alternative strategy is to use steroids to speed recovery, and it is the outcomes from this management strategy that a group from **Beijing (China)** have investigated with a systematic review.[2] The authors searched the usual biomedical databases for relevant randomized controlled trials and uncovered 67 studies on

initial screening, of which six met their inclusion criteria. A single study showed negative results pertaining to the use of intravenous steroids in reducing postoperative dysphagia after single-level anterior cervical discectomy and fusion (ACDF). In contrast, six randomized controlled trials appeared to show that perioperative systematic or local steroid use reduced frequency and severity of dysphagia in either multilevel ACDF or anterior cervical surgery. This review suggests that steroid use following surgery reduces dysphagia; however, the practicalities of this remain to be seen when the complications and side effects of steroid use are considered. The use of steroids once dysphagia is established is as yet undecided, and perhaps addressing this question would be of clinical value in the future.

Intermediate screws or kyphoplasty: treatment of single-level burst fractures

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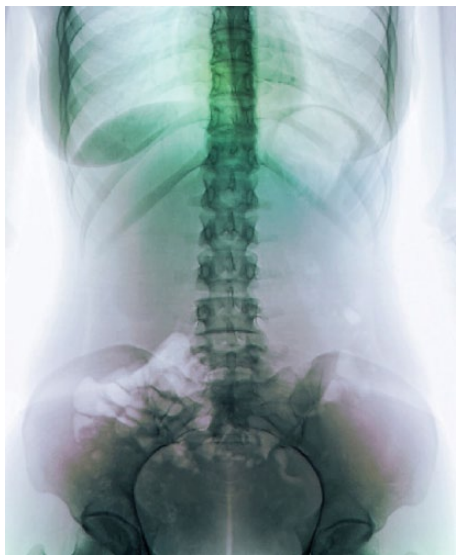
■ There are many options described for managing thoracolumbar fractures, including – but not limited to – short or long segment fixation, cement augmentation, and vertebroplasty. Each has its potential advantages and disadvantages. For patients with instability or bony encroachment on the canal, surgical stabilization is a reasonable treatment choice. Aside from the controversy surrounding short or long segment fixation, there is further discussion surrounding the use of intermediate screws (i.e. a screw inserted at the level of the fracture) *versus* cement-assisted kyphoplasty in correcting the post-fracture deformity. A group from **Jiangsu (China)** have investigated this quandary using a simple retrospective review of 48 patients, each of whom had sustained a single-level thoracolumbar burst fracture that was treated with short segment pedicle screw fixation, accompanied by either an intermediate screw or kyphoplasty.[3] The group defined failed treatment as fixation failure or the loss of Cobb angle correction by more than 10°. In terms of outcomes that could be gleaned from this relatively small series, the study team showed that fluoroscopy time, surgical duration, and intraoperative blood loss were lower when patients were treated with intermediate screws rather than kyphoplasty. Patients treated with kyphoplasty had lower visual analogue scale scores and showed a greater anterior vertebral body height. Both treatment options showed a correction loss of 4° and a 10% failure rate. Overall, this study suggests that posterior stabilization of single-level thoracolumbar burst fractures treated with instrumentation and kyphoplasty provides better back pain relief and greater anterior vertebral body height, whereas intermediate screw fixation has the advantages of a reduced surgical duration, fluoroscopy use, and blood loss. Ultimately, the techniques used will be at the discretion of the operating surgeon; however, this adds weight to the argument that vertebral body augmentation may have a larger role to play in managing these injuries than we presently appreciate.



Fusion rates for ALIF

■ Anterior lumbar interbody fusion (ALIF) is becoming increasingly common as surgeons gain experience with the approaches and technique. It has many indications, some definite and some debated. A powerful exponent of its use is the excellent rate of interbody fusion, which is quantified in this study from **New York, New York (USA)**.[4] The authors searched the usual biomedical databases for studies examining spinal fusion rates achieved by ALIF when unaccompanied by posterior instrumentation or supplemental posterior fusion. A total of 840 studies was reduced to 55 when exclusion and inclusion criteria were applied, reporting the outcomes of a respectable 6303 fused vertebral levels. Overall, fusion rates were found to be 88.6%, which improved to 94.2% when anterior plating was added to the construct. Lower rates of fusion were identified by studies in which smokers or workers' compensation featured as a cohort characteristic. Interestingly, the authors note that in groups where recombinant bone morphogenetic protein (BMP-2) was used, fusion rates approached 95% in contrast to 85% where it was not. ALIF, then, appears to yield excellent fusion rates, particularly when patients are not smokers and are litigation-free. There may be a role for BMP-2 in selected cases; however, this requires further characterization before it can constitute a recommendation. In the meantime, ALIF seems to be a promising strategy in relieving symptoms emanating from compromised motion segments.

Prevention of nerve root thermal injury caused by bipolar cauterization near the nerve roots

■ Bipolar diathermy is used to cauterize epidural veins during spine surgery for haemostasis and exposure of neural structures. However, even with bipolar diathermy, which protects the nerve roots from current arc, there is potential for thermal damage to neural structures. The exact mechanism of any potential injury and the factors that could decrease the risks are unknown. The authors of this study from **Osaka (Japan)** have used a rabbit model to investigate the effect of irrigation, changing the direction of the forceps and the use of locally injected corticosteroid post-cauterization through measuring temperature and conducting a histological examination.[5] The study showed that following 'parallel' cauterization (i.e. with the forceps held such that the current passes parallel to the nerve), the temperature of the surrounding site reached 60.9 °C and 47.8% of the nerves showed histological damage. The addition of saline irrigation restricted the temperature to up to 42.7 °C, at which point no histological changes were observed. When bipolar forceps were held in a perpendicular fashion, the surrounding temperature reached only 40.4 °C. A corticosteroid injection reduced the incidence of nerve damage to 25.0%. There is a very clear message here: with just a simple change in the orientation of the forceps, such that the current flow is not encouraged through the myelin sheaths of the nerve roots, the increase in temperature is kept within a very safe range. Of course, the limitations of this study include the fact that histological change may be asymptomatic in the clinical setting, and that histological examination was not performed when the forceps were held in the perpendicular position due to rabbit numbers. However, the message of this study is clear: use saline irrigation and hold the forceps perpendicular to the nerve to limit the rise in thermal temperature.

Patients cannot reliably distinguish the iliac crest bone graft donor site from the contralateral side after lumbar spine fusion: a patient-blinded randomized controlled trial

■ Autologous iliac crest is considered the benchmark bone graft for fusion due to its intrinsic properties. However, donor site morbidity and pain is a

common reason for surgeons to opt for synthetic substitutes, which can be costly and can potentially provide less high-quality bone graft. This study from **Utrecht (The Netherlands)** investigated whether patients could correctly identify from which iliac crest their bone graft was harvested, and whether that side was more painful than the contralateral, unoperated side.[6] This study was a multicentre, randomized, intra-patient controlled study involving 90 patients undergoing a lumbar fusion below L3. Patients had bone graft harvested from either the right or left iliac crest via their primary midline incision and the left/right distribution of the donor site was randomly allocated on a 1:1 basis. Patients were then followed up clinically for up to a year; at each timepoint, patients were asked to identify the donor site and rate the pain in their back and in their right and left iliac crests on a visual analogue scale (VAS). Only 24% of patients correctly identified the harvest site side. The VAS scores for the donor site and the contralateral side did not differ. Bone graft harvest site scores were also lower than the back pain score for every follow-up timepoint. The authors conclude that patients could not reliably identify the iliac crest bone graft side and that donor site pain should not be a reason to use bone graft substitutes when harvested in this manner. It is, of course, important to distinguish this type of posterior bone graft harvest from the anterior approach, where a separate incision is made and there is a considerable incidence of postoperative pain.

Predictive factors of postoperative dysphagia in single-level ACDF

In another paper examining the phenomenon of dysphagia following an anterior cervical discectomy and fusion (ACDF), researchers set out to establish the potential risk factors for dysphagia. Previous research has established that dysphagia can occur in the immediate postoperative period in as many as 83% of patients undergoing ACDF, and can be a persistent problem in up to 35% of patients. This study from **New York, New York (USA)** examined various surgical and implant parameters, and assessed their overall influence on the rate of subsequent symptomatic dysphagia.[7] The study was a retrospective review of 64 patients, all of whom underwent an ACDF, who were divided into two groups: a zero-profile device group (41 patients) and a 'traditional' plate/cage group (23 patients). Dysphagia was assessed using a Swallowing Quality of Life (SWAL-QOL) score that was collected preoperatively, as well as at six and 12 weeks postoperatively. This score consisted of 44-items rated from 1 to 5 (worse to best), and is in wide use in the dysphagia literature. In terms of matching, both groups were similar regarding patient demographics but differed regarding operative time; the zero-profile implant group were found to have a shorter mean procedure time than the cage-plate group. Dysphagia rates were similar at all timepoints between the groups. Regression analysis indicated that preoperative SWAL-QOL and procedure time were the only significant variables. This is somewhat surprising, and calls into question the perceived wisdom that proud implants may be partly to blame for postoperative dysphagia. While this is a small, retrospective study, it emphasizes the importance of reducing surgical time (or maybe releasing surgical retraction at intervals), particularly if a multilevel procedure is being performed. It also suggests that perhaps a swallowing score should be recorded routinely in the preoperative phase, as a low preoperative score is associated with an increased risk of postoperative dysphagia. What is clear is that dysphagia is part and parcel of anterior cervical spine surgery for a number of patients, and that preoperative counselling should make this clear. Despite improvements in implant designs, it seems that the approach itself is the main culprit.

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Trauma

X-ref ***For other Roundups in this issue that cross-reference with Trauma see: Foot & Ankle Roundups 3 & 6; Wrist & Hand Roundups 1 & 3; Shoulder & Elbow Roundups 2 & 4; Spine Roundup 3; Children's orthopaedics Roundup 8; Research Roundup 5.***

Is the dynamic hip screw safer in hip fracture?

One of the most controversial studies in trauma practice this year arises from the National Hip Fracture Database (NHFD), with the analysis led by a team in **Bristol (UK)**.[1] The authors addressed the recurring issues of whether to use a sliding hip screw or an intramedullary nail in the treatment of pertrochanteric hip fractures from a national registry perspective. There have been a number of robust randomized controlled trials that have given a somewhat mixed message, suggesting that functional scores may be better with intramedullary nailing at the cost of a slightly higher complication rate. These same trials have failed to show the clinical advantages of nailing these fractures in terms of discharge destination, quality of life, and other outcome measures, despite the potentially better biomechanical properties. The current study examines the problem from the other perspective and asks whether there is a difference in mortality rates between the two implants. The work presented here is based on the episode data of 82 000 patients entered on the NHFD and linked to the United Kingdom's death statistics. Although their headline figure is a 12.5% increase in mortality associated with the use of nails, there are some caveats that require attention. While there is a reasonable explanation as to how mortality rates could be higher (instrumenting the canal is likely to increase embolic events), there are other factors that may account for the differences here. The case mix is unlikely to be equally matched. Practice in