

diabetes, obesity and depression) were not at higher risk of further surgery.

### The course of degenerative lumbar spondylolisthesis

■ Lumbar degenerative spondylolisthesis is one of the most common spinal disorders in the Japanese population and presents a challenging problem for intervention, with a difficult evaluation surrounding the decision to operate. In patients with progressive degenerative lumbar spondylolisthesis, clearly early surgical intervention is to be preferred. Researchers in **Wakayama (Japan)** have published a highly informative longitudinal cohort study tracing the natural history of lumbar degenerative spondylolisthesis in the community over a 15-year period.<sup>5</sup> Their study reports on the 15-year follow-up of 200 participants in a rural community in Japan. All participants were over the age of 40 and index and follow-up radiographs were obtained 15 years apart. The overall baseline prevalence of lumbar degenerative spondylolisthesis was 10% with the majority of cases at L4. The incidence of new slip over the 15-year period of the study was 15% and the follow-up radiographs demonstrated a prevalence of 22.5%. The predictors of slip progression in this observational study were of younger age (less than 60 years), female sex and dysmorphic facets. Patients with these factors at baseline should be

treated with a lower threshold for early stabilisation. Due to the difficulties of reduction of a chronic slip and the ongoing symptoms patients may experience, early intervention when progression is likely seems to be a sensible course of action.

### Hip or lumbar spine a common conundrum X-ref

■ Distinguishing between hip, knee and lumbar spine pain can be tricky. Certain patterns of spinal claudication can present in an identical pattern to both. However, perhaps even more tricky is establishing what the clinical course is likely to be when different diagnoses are co-existent. From the patient's perspective the problem is simple: they wish to lose the pain that is limiting their walking. What we don't really have a handle on, however, is the results of lower lumbar spine pain and the impact it has on clinical outcomes following total hip arthroplasty (THA) for degenerative hip disease. A study team in **Rostock (Germany)** have set their minds to unpicking precisely this question.<sup>6</sup> Their prospective study was designed to investigate the influence of lumbar spinal disease on both the pre- and post-operative health-related quality of life scores in patients undergoing total hip replacements. The study concerned the outcomes of a relatively modest 42 patients, all undergoing cementless THA who were a mixture

of patients with co-existent spinal pathology (13 patients), and without (29 patients). As would be expected in a study of this nature, a range of outcome measures including the Harris hip score, WOMAC OA score and SF-36 quality of life score, was



administered to both groups. A straightforward subgroup analysis was undertaken to establish the comparative outcomes of both groups. While both groups showed a clear improvement in outcomes compared with pre-operative scores, there was a clear impact of lumbar spinal pathology demonstrated. The study showed that while pre-operatively there were no differences in the hip-specific scores, the SF-36 in the lumbar spine group was poorer and at each post-operative assessment, those with lumbar spine pathology were outperformed by those without. A salutary lesson in

patient selection. This study supports the practice of undertaking THA in patients with co-existent lumbar spine pathology but, based on the compromised functional results, clinicians should perhaps 'underpromise and over-deliver'.

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## Trauma

**X-ref** For other Roundups in this issue that cross-reference with **Trauma** see: **Foot Roundup** 6, 7, 8; **Hand Roundup** 4, 9; **Shoulder Roundup** 3, 4, 6; **Paeds** 1, 3.

### Delay to surgery in hip fracture x-ref Hip

■ Much progress has been made in the care of hip fracture patients over the last decade, but there may be more to do. While this is admittedly a

retrospective study, these Danish surgeons (**Copenhagen, Denmark**) have looked again at the confusing topic of delay to surgery for hip fracture patients.<sup>1</sup> This retrospective analysis of 3517 patients accessed from the Danish Fracture Database was designed to examine if the outcomes of hip fracture surgery were dependent on timing of surgery following injury. The overall mortality in

this cohort was in line with other contemporary studies, with 380 deaths at 30 days (10.8%) and 90-day mortality was 17.4%. The authors established that, in their study at least, the risk of 30-day mortality increased with surgical delay of more than 12 hours (OR 1.45). Also associated with increased mortality were: having a trainee surgeon perform the procedure, being a male patient, and having a higher

ASA. Although these results make intuitive sense, there does not appear to really be an appropriate level of adjustment for confounders in this group and it may be that all this is reporting is selection bias.

### Hexapod fixators in the management of hypertrophic tibial nonunions

■ Nonunion is more common in the tibia than in many other bones

due to a combination of patterns of injury (usually high-energy) and poor blood supply. Treatment of nonunion in the tibia represents a significant health economic burden, requiring specialist surgeons and lengthy, complex operations. An option that potentially reduces the morbidity associated with tibial nonunion is the application of a frame distractor to adjust the fracture biomechanics and thereby achieve union. Although only really suitable for hypertrophic nonunions, this does represent an attractive option with a single surgery and little delay. This consecutive series of 46 tibial fracture nonunions is reported using treatment with closed frame distraction in **KwaZul Natal (South Africa)**.<sup>2</sup> Bony union was achieved in this series in 89% of patients after a single surgery, with length and alignment corrected within an average of 23 weeks. The authors highlight that all the patients they treated had stiff, hypertrophic nonunions, and it is their experience that frame distraction works well in such patients.

#### **Thromboembolism after nailing pathological fractures X-ref**

■ An increasingly common problem in general trauma is that of pathologic deposits. As survivals are increasing for solid organ tumours, so are numbers of patients who may present with metastases. These patients are rather challenging to treat as quality of life is paramount, they often have complex medical problems and are at higher risk of a range of complications including thromboembolism. Researchers in **Philadelphia (USA)** undertook a retrospective review describing their experience with 336 pathological long bone fractures.<sup>3</sup> The overall incidence of symptomatic venous thromboembolic events in their series was surprisingly high, affecting 7.1% of patients. These break down into 3.9% pulmonary embolism and

3.3% deep vein thrombosis. This was despite thromboprophylaxis for all patients. In terms of risk factors, lung cancer as the pathology was significantly associated with both forms of event, however, the method of thromboprophylaxis didn't appear to make a difference. There was also a higher (but non-significant) rate of thromboembolic events in patients who had undergone radiotherapy. Clearly, one should interpret the study in the context of personal views regarding thromboprophylaxis and its effectiveness and safety in orthopaedic surgery, however, quantification of the significant increases in baseline rates of thromboembolism, even when thromboprophylaxis is administered, is valuable information.

#### **Tibial plateau fracture patterns under the spotlight**

■ The venerable Schatzker classification is universally taught and used, but we would all admit it has significant limitations in describing more complex fracture patterns. The original classification was made purely on the AP radiograph, and only really addresses coronal plane fractures. The classification doesn't really address posterior and medial elements which are poorly described, particularly with respect to determination of treatment. This study from **Amsterdam (The Netherlands)** reviews the CT scans of 127 patients suffering a proximal tibial fracture and aims to describe the injuries in a more anatomic way using cross-sectional imaging, as has been described for the pilon.<sup>4</sup> Review of all of the scans identified four frequent characteristics in the fracture patterns: 75% had a lateral split fragment, 43% had a posteromedial fragment, 28% had a zone of comminution centrally including the spines and extending into the lateral plateau, and 16% had a tibial tubercle fragment. None of these characteristics has previously been described in formal terms of incidence. Understanding the presence, in particular, of the posteromedial

fragment, its size and orientation, will aid approach and fixation strategies. Although the authors do not propose a new classification or attempt to relate their findings to treatment outcomes or strategies, their discoveries may well form the basis for future studies.



#### **The health economic effects of long bone nonunion**

■ Having a nonunion following a long bone fracture is widely known to have a significant impact on patients' quality of life. While much work has been conducted establishing the consequences of tibial nonunion and other long bone nonunions, there is surprisingly little in the way of comparative information. A study group from **Houston (USA)** have attempted to quantify this effect by comparing utility scores.<sup>5</sup> The study team used the 'time trade off' (TTO) approach, a form of utility score methodology which, while flawed, does give an indication of comparative health utility. The methodology involves asking patients how many years of remaining life they would give up in return for a full state of health for the remainder. This was administered to 832 consecutive patients, all with nonunions, whose TTO scores were identified. The overall TTO score was 0.68, although there were significant differences between nonunion site (forearm 0.54, clavicle 0.59, femur 0.68, and tibia 0.68). Forearm nonunions had the lowest utility score and so the worst patient impact, with the mean scores poorer

than that for diabetes, stroke or HIV, indicating the profound quality of life impact such nonunions have for patients. Early recognition and treatment of nonunions, whatever the cause, is clearly essential.

#### **Adverse outcomes in trauma**

■ Researchers from Vanderbilt University, **Nashville (USA)** compared the risk of complications using the very large database of the American College of Surgeons National Surgical Quality Improvement Program.<sup>6</sup> The analysis was designed to identify the adverse event rates for orthopaedic trauma patients, and go on to stratify these risks by anatomic region and patient risk factors. The study cohort consisted of 146 773 orthopaedic patients, including 22 361 with trauma diagnoses. After controlling for the risk factors available in the dataset, the investigators established that trauma patients were twice as likely as general orthopaedic patients to sustain complications (11.4% vs 4.1%). Patients with hip and pelvic injuries were four times more likely to develop a peri-operative complication compared with patients with upper extremity injuries, and patients with lower limb injuries were three times more likely to develop a peri-operative complication than those with upper extremity injuries. While it stands to reason that in the less controlled environment of trauma, the risks and complications of healthcare provision are likely to be higher, this is the first paper we have come across here at 360 to quantify in sufficient numbers the size of the problem.

#### **The sacral screw in children X-ref**

■ Sacral fractures in the growing pelvis can be tricky both to diagnose and to treat. Given their rarity they are often treated in tandem with adult and paediatric consultants, and adult algorithms and treatment strategies are frequently used for operative stabilisation. In short, there is a lot we don't know about how best to treat these rare injuries. In one of the few reports

on treatment, surgeons in **El Paso (USA)** have focused on the sacral fracture and specifically the use of the iliosacral screw.<sup>7</sup> As perhaps might be expected, the authors were able to assemble a very small series of just 11 paediatric patients presenting with sacral injury. They were all treated with one or more iliosacral screws, with ten of the 11 patients achieving stable fixation and healing. The technique in this series was feasible in children as young as six years old, with overall good stability and minimal complication rates.

### Treating the contralateral SUFE X-ref

■ Opinion still remains very divided about whether to treat the asymptomatic hip in patients who present with a slipped capital femoral epiphysis for the

first time. Presenting often as part of the general trauma ‘take’, it is difficult to know what proportion of patients are acute, chronic, or acute-on-chronic. A retrospective study (**Edinburgh, UK**) reviewing 86 patients treated over a ten-year period considered outcome and cost in two groups of patients treated in different ways.<sup>8</sup> Prophylactic contralateral fixation was performed in 36 cases, and the results of these were analysed for cost effectiveness against a larger group where no procedure was performed initially (n = 50). If no prophylactic fixation was undertaken, the rate of secondary slip was 46%, giving an overall cost of the quality-adjusted life year QALY gained at £1431 for prophylactic fixation. This is clearly on the side of cost effectiveness and has resulted in significantly fewer complications,

better health measure scores (SF-12) and, in longer-term follow-up, no visible radiographic cam lesions. It certainly seems that the evidence is accumulating in favour of prophylactic pinning.

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## Oncology

**X-ref** For other Roundups in this issue that cross-reference with *Oncology* see: [Trauma Roundup 3](#).

### Amputation may not be the best option

■ Limb salvage has become the norm as survival rates with modern adjuvant therapies have become similar to those following amputation, with the tantalising thought of better function. However, the question is: do amputations for tumour really do that badly? Tumour surgeons in **Birmingham (UK)** have set out to establish the functional results following amputation for tumour using a prospective cross-sectional national survey.<sup>1</sup> Prospectively, 250 patients were approached to take part in the study and 100 responded, all of whom had undergone amputation for soft-tissue sarcoma. Collated outcomes included functional scores, pain and quality of life (QOL) scores. The entire range of amputations was included in the survey, including patients who had undergone hemipelvectomy, hip disarticulation, transfemoral amputation,

knee disarticulation, transtibial amputation, toe amputation and rotation-plasty. Outcomes were assessed using the Toronto Extremity Salvage Score (TESS), and the key determinants of outcome with this measure were poorer results for higher amputation levels, older patients and those with phantom limb pain. This paper really does highlight the poor function and problems faced by amputees following tumour surgery. The next step will be to show that limb salvage surgery really does give better outcomes as previous studies have shown no difference in QoL between them – although many of these were historical series.

### Growing golf balls bad news!

■ We like clear messages here at 360, and we like them even more if they are simple. This paper presents a very clear message - if your lump is bigger than 4 cm, “think sarcoma”. The relative rarity of sarcoma as a primary diagnosis makes picking them up very difficult. Authors in **Birmingham (UK)**, noting that one, or fewer, in 100 soft-tissue

lumps seen in primary care are malignant, designed a study with the aim of establishing the best criteria for referral to a specialist centre.<sup>2</sup> They generated a Bayesian Belief Network to estimate the likelihood of malignancy based on characteristics at initial presentation in an 11-year cohort of patients, all referred with suspicion of a soft-tissue sarcoma. Their cohort consisted of around 3000 patients, roughly divided 50:50 between benign and malignant conditions. The study team used potential covariates of growing size, age, size of lump and duration of symptoms, and the model had an impressive 0.77 area under the curve for prediction of malignant sarcoma. In a rather pithy take-home message, the study team concluded “If your lump is bigger than a golf ball and growing, think Sarcoma”.

### How close is safe? Radiotherapy and surgery

■ The development of modern radiotherapy protocols has improved outcomes significantly in terms of

survival in soft-tissue sarcoma. However, it does beg the question (given the excess surgical complication rates, particularly wound breakdown and infection), how close to the completion of radiotherapy (RTx) is it realistically reasonable to undertake surgery? There is little evidence as to when is the optimum time for surgery. This helpful study from **Toronto (Canada)** reports the outcomes of 798 soft-tissue sarcoma patients, all with extremity tumours managed with synchronous radiotherapy and surgical excision.<sup>3</sup> The effectiveness of surgical timing was assessed with a primary outcome of surgical complications within 120 days of surgery. Surgery was performed on average 41 days following RTx, with a complication rate of around a third. There were no significant differences in rates between early (pre-three weeks) and late (post-three weeks) surgical complications. There has been an increasing trend to give pre-operative RTx for many soft-tissue sarcomas, and in light of this paper, it does appear that there is little