

the cohort consisted overwhelmingly of normal Graf type I hips (97%, n = 351/362), requiring no treatment or follow-up. Of the remaining 11 children, nine (2.5% of the total cohort) had Graf type II hips, all resolving on follow-up scans. There were just two children requiring treatment: one with Graf type III hip dysplasia and one child with an irreducible hip dislocation. Given the large number of patients in this cohort (nearly 400), the very low specificity (0.5%), and the unknown sensitivity of the clinically

clicky hip, we would agree with the authors of this paper – only a strong family history or positive ‘special’ tests should trigger a referral to a specialist paediatric service, and not clicky hips alone.

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Research

X-ref For other Roundups in this issue that cross-reference with *Research see: Hip Roundups 1, 3 & 4; Knee Roundup 8; Spine Roundups 2 & 7*

Serum fructosamine: a simple and inexpensive test for assessing preoperative glycaemic control **X-ref**

■ It seems to make sense that glycated haemoglobin (HbA_{1c}) levels, which are a marker of glycaemic control, would give an indication of the likelihood of complications, especially given the known association between diabetes and pretty much every complication under the sun. However, evidence is mixed; reports are conflicting and meta-analysis has been far from conclusive. In this age of bundled payments, risk adjustments, and penalization of surgeons and healthcare providers for both complications and readmissions, it is important for us to use the correct parameters to risk-adjust our patients. This study from **Philadelphia, Pennsylvania (USA)** highlights and reports on the use of serum fructosamine as a potential method for risk-scoring patients with diabetes.¹ Fructosamines are glycosylated compounds consisting of a sugar and a primary amine. Although there are some recognized biological pathways, the clinical significance is unclear. The fructosamine test is

a surrogate measure of glycaemic control over a two- to three-week period; however, a significant clinical role for the diagnostic test has not yet been found, with HbA_{1c} the most commonly utilized test. The authors report 829 patients undergoing total joint arthroplasty, recruited over a single year, in whom they measured the serum HbA_{1c}, fructosamine, and blood glucose levels. As there are no widely accepted reference ranges for fructosamine tests, the fructosamine threshold established was that which equated to the American Diabetes Association 7% cutoff for HbA_{1c}, giving a fructosamine level of 292 µmol/L. Patients were followed up and the association between high fructosamine levels and total joint arthroplasty complications was reported. In this cohort, there were 119 diabetic patients (14.4%) and 308 patients (37.2%) with HbA_{1c} levels in the prediabetic range. Of these, there were 51 patients with fructosamine levels of ≥ 292 µmol/L, of whom 20 (39%) did not have an HbA_{1c} level of ≥ 7%. In this series, there was a clear correlation between fructosamine levels and odds of deep infection (odds ratio (OR) 6.2), risk of re-admission (OR 3.0), and reoperation (OR 3.4). Given that in the same patient cohort the HbA_{1c} levels were not correlated with complications such as deep infection, readmission,

or reoperation after total joint arthroplasty, fructosamine may be the screening test of the future for our patients.

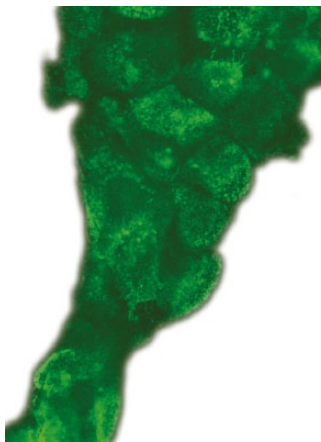
Preferably not my surgery: overlapping surgeries

■ Concurrent surgery debates have occurred throughout most surgical fields, and studies have previously been focused on safety outcomes. The advantages for the surgeon and healthcare provider are obvious, with the ability to maximize output from the senior surgeon without requiring double the resource. Nevertheless, despite this approach being high on the agenda of many healthcare founders, there is surprisingly little research into the patient’s approach to being part of ‘conveyor-belt’ medicine. This team of researchers from **Chicago, Illinois (USA)** turned the tables on the previous research and focused on patient acceptability rather than the safety aspects.² The authors of this survey-based study investigated the attitudes of 200 patients and family towards concurrent and overlapping surgical procedures. They asked respondents to assess their comfort level with different surgical scenarios, and also explored their beliefs on possible underlying reasons for such surgical situations. Although this is plainly something of a ‘soapbox’

study and it is clear that the authors may not be entirely in equipoise about the prospect of concurrent or overlapping surgical procedures, the paper is valuable in that it sheds further light on what is sure to be a long and drawn-out debate. There was little enthusiasm in the cohort for the approach and, on average, respondents were neutral about the prospect of surgical procedures involving overlap of two noncritical portions. They were, however, not comfortable with overlap involving a critical portion of one or both surgical procedures. The resounding message was that patients believe hospitals allow the practice of overlapping surgical procedures to increase revenues. As we take care of our patients, we need to be cognizant about disclosing concurrent surgeries and gauging the comfort level of our patients and their family members.

Physician-owned hospitals: always a bad thing?

■ Government regulations in the USA enacted as part of the Affordable Care Act are being imposed on physician-owned hospitals. Ostensibly, this is to improve outcomes and drive down costs, with the logic being that physician-owned hospitals will have a more profit-centred approach than their government-



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charity-, or insurance company-owned equivalents. In an interesting study from Rush University Medical Center in **Chicago, Illinois (USA)**, the investigators set out to establish if there were differences in safety and costs of care provided at physician-owned hospitals.³ The research team used hip and knee arthroplasties as their index procedures and used the US Centers for Medicare & Medicaid Services (CMS) Inpatient Charge Data to compare 45 physician-owned hospitals and 2657 hospitals that are not physician-owned. The study considered economic data, satisfaction scores, risk-adjusted complication rates, and 30-day readmission rates in patients undergoing knee and hip arthroplasty. The outcome of the study is that (very surprisingly) the costs of treatment for hip or knee arthroplasty were lower in physician-owned facilities (\$11 106 vs \$12 699). When taken alongside essentially identical readmission rates and a lower risk-adjusted complication score (2.83 compared with 3.04), it appears that the physician-owned hospitals are not only cheaper but also provide better care. To cap it all, the physician-owned hospitals outperformed the comparator hospitals in all patient satisfaction categories. There is a more profound take-home message in this paper than the simple conclusion that physician-owned hospitals are not bad. This paper also demonstrates that physicians understand their patients and the care that

they need. Even if a hospital is not physician-owned, placing physicians in positions of influence over the care provided by all hospitals is clearly likely to improve outcomes and reduce costs. Perhaps the issue of specialist- and physician-owned hospitals should be revisited, both in the United States and elsewhere.

EUROHIP: large joint arthritis and hip arthroplasty outcomes X-ref

■ Here at 360, we were intrigued by this article from the multicentre EUROHIP collaborative led by researchers in **Zürich (Switzerland)**, who set out to examine the effects of other large joint arthritis on outcomes following total hip arthroplasty (THA).⁴ The study encompasses the outcomes of 1327 patients treated in 20 centres, all of whom underwent primary THA. The authors sought to determine the relative effect size per patient of THA using the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) score. Patients were stratified according to combinations of other major joint arthritis into four groups of musculoskeletal morbidity grades: 1, single major joint; 2, multiple major joints; 3, single major joint and spine; and 4, multiple major joints and spine. The authors had complete outcome data at a year for 845 patients. When looking at the stratified outcomes, there was a clear difference in effect size for hip arthroplasty as an intervention when considering the involvement of other major joints and the spine. The use of the musculoskeletal morbidity grades had a strong influence on one-year outcomes following THA. However, although the effect sizes were smaller with higher grades of musculoskeletal comorbidity, there was still a > 74% favourable outcome rate in the surgical intervention group. This is a timely paper. As the world moves towards an increasingly evidence-based approach to treatments, and randomized

evidence is required to support new and established interventions, the quantification of the effects of musculoskeletal comorbidity is essential in study design and interpretation of the results.

Sleep disturbance and subjective knee pain

■ It has long been established that emotional stress and psychological wellbeing (in particular depressive indices) have an effect on perception of pain. This fantastic study from **Miyagi (Japan)** examines the effect that a massive disruption and external stressor, such as the Great East Japan Earthquake (GEJE) and Tsunami, has on the perception of knee pain, and how psychosocial factors (including sleep disturbance and anxiety) may have a role to play in this perception of pain.⁵ The report focuses on the outcomes of 1470 survivors of the earthquake and subsequent tsunami, and is essentially a prospective cohort study. The patients self-reported outcome scores two and three years following the earthquake. The authors report new-onset subjective knee pain and relate it to the Kessler Psychological Distress Scale and the Athens Insomnia Scale. Among the participants, 10.9% (160/1470) reported experiencing new-onset subjective knee pain. Sleep disturbance was significantly associated with new-onset subjective knee pain (OR 1.57, 95% confidence interval (CI) 1.08 to 2.29, $p=0.017$). However, psychological distress was not (OR 1.07, 95% CI 0.65 to 1.78, $p=0.80$). While it has been clear for some time that pain and emotion are related in a range of pathologies, this is probably the first study that has pointed out the relationship between knee pain and sleep disorder. There is clearly a lot to learn here, and studying patients' somatic symptoms in the face of psychologically challenging circumstances can give a unique insight into the relationship between pain perceptions and psychological health and wellbeing.

Infection risk following single-level lumbar fusion surgery X-ref

■ There is no single risk factor that results in infection; rather, it is the interplay between patient, surgical, and procedural factors. However, infection is such a dire complication, particularly in the spine, that to understand fully which factors are risks for infection and to quantify them is clearly important if patients are to be optimized pre-surgery. In this study, authors from **Chicago, Illinois (USA)** used a large retrospective analysis of prospectively collected infections and complications data from a cohort of 3353 patients, all of whom underwent single-level fusions.⁶ The overall event rate was 5.2% with 173 postoperative infections. Unusually, the authors chose to include nonsurgical site infections such as urinary tract infections (UTIs) and pneumonia in this report. There were just 2.6% of patients who suffered a surgical site infection (SSI). Their study identified obesity, advanced American Society of Anesthesiologists (ASA) classification of more than 2, and operative time of more than six hours as predictive factors of postoperative SSIs. Increased age, female gender, serum creatinine levels of more than 1.5 mg/dl, and operative time of more than six hours were associated with non-SSI infectious complications. Clearly, a number of these risks can be mitigated, either by patient optimization or by streamlining surgical technique to reduce infections. The time for which the patient is physically on the operating table, in particular, should be kept below six hours. We are at a loss, here at 360, to work out exactly how one can spend six hours fusing a single vertebral level, and we wonder if this is a surrogate marker for surgical inexperience or low volume.

PEEK radiolucent intramedullary nails in the humerus X-ref

■ The difficulties associated with certain types of metal-on-metal

(MoM) bearing have had a rather negative effect on innovation in orthopaedics. With regulators around the world taking another look at their policies and procedures, surgeons eyeing new innovation with skepticism, and medical device companies worried about the potential for multimillion dollar liabilities associated with compensation payments, the pace of change has slowed down somewhat over the last few years, which is no bad thing. Along with a more risk-averse approach, the push from the regulators to see clinical data (and independent clinical data) before granting licences and claims would appear, to us here at 360, to be a positive evolution. We were interested in this prospective multinational clinical study led by a team from **Dubrovnik (Croatia)**.⁷ They have evaluated the clinical performance of

a novel polyetheretherketone (PEEK) intramedullary nail (IM) nail in a series of 46 patients, all with humeral fractures. The cohort was reasonably representative of clinical practice, with a 65% female preponderance and a mean age of 65. There was a 100% incidence of postoperative shoulder pain, but this was self-limiting, and transient radial nerve palsies were also seen in two patients. Perhaps more worryingly here were two patients (4%) who required revision of the implant for malposition, although there were no reported overt implant-related complications. There were 43 patients who completed follow-up successfully and all of these had achieved bony union at 12 months. These results are promising, although not conclusive. What is really encouraging is the shift in introduction of novel technologies that we are starting to see. The PEEK

humeral nail does potentially offer some advantages, and while a larger clinical study and post-market surveillance are clearly still required, this paper does give some reassurance that there is unlikely to be any major unforeseen problems.

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