

and surgeon education in order to improve the working environment and conditions for these surgeons.

Timing of slipped upper femoral epiphysis surgery and success

■ The etiology of avascular necrosis (AVN) following slipped upper femoral epiphysis (SUFE) is not thoroughly known. Authors from across **Japan** have asked the question, does the timing of surgery have any impact on the likelihood of development of AVN following SUFE?⁶ They designed and reported their multicentre study which includes the outcomes of 60 patients, all with an unstable slip presenting over a 29-year period - just two a year. The group was divided into those with an acute fixation (< 24 hours from onset of symptoms), between one and seven days, and a late fixation group > 7 days, with the outcome of AVN within the follow-up period. In their series, closed reduction had a lower rate of AVN than open reduction (27% vs 35%). Perhaps most interestingly, the authors established that — in their series at least — fixation in the middle period was associated with the highest AVN rate (77%), as opposed to acute (18%) and later (20%) rates. This does raise

a number of questions, and it certainly could be that the ‘late’ ones represent acute chronic slips and as such are not really ‘late’. However, the authors’ multivariable analysis did identify the ‘middle’ period as an independent risk factor for AVN, even when potential confounders were taken into consideration. This reinforces the findings of the most recent meta-analysis⁷ which suggests that the lowest AVN rates are seen when done acutely with *in situ* fixation. What this adds over the meta-analysis is the suggestion that the later fixation group do nearly as well.

Developmental dysplasia of the hip in Japan X-ref

■ Developmental dysplasia of the hip (DDH) is the most major hip problem in Japan, with incidence rates higher than in many other parts of the world. This new epidemiology paper from **Okayama (Japan)** sheds some light on how this has changed over the past 40 years with the implementation of prevention and screening programmes.⁸ The authors conducted a prospective audit of 1987 treating medical institutions over a two-year period in Japan. During the period of the audit the authors were able

to capture information on 783 institutions, reporting 1295 cases of DDH-related hip dislocation requiring treatment. The overwhelming majority were girls (89%) with recognised risk factors present in 27% for family history, 56% being new born babies and 15% being associated with an abnormal lie. Rather worryingly, 15% of cases (n = 199) were diagnosed at over one year of age. Despite the majority of these children having received an earlier routine screening test, the diagnosis had not been made. There is ongoing debate in the majority of healthcare systems about the value or otherwise of screening for developmental dysplasia. This is one of the largest series reporting late DDH presentations. There is clearly the need for more clarity on the indications for screening, and this paper raises two key questions: should there be early routine screening, and for those with risk factors on an equivocal initial screen, should there be a second point of screening a few months later?

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Research

X-ref For other Roundups in this issue that cross-reference with **Research see: Knee Roundups 3, 4, 7; Foot & Ankle Roundup 3; Hand & Wrist Roundup 3; Trauma Roundup 8.**

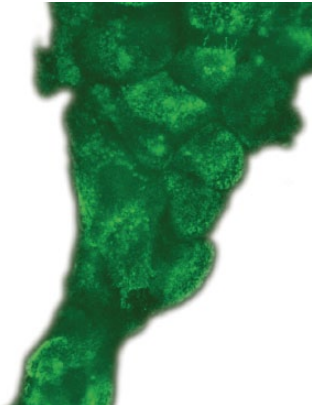
Chondrocyte implantation versus microfracture in the longer term X-ref

■ Researchers in **Tromsø (Norway)** have set out to answer one of the remaining difficult dilemmas in knee research: that of the osteochondral lesion.¹ Although there have been a large number

of papers published on a variety of new methods of regeneration, the production of hyaline cartilage following a chondral lesion remains a controversial area, with the ‘definitive’ treatment and study probably yet some way off. There are still proponents of the simple ‘microfracture’ citing simplicity, ease of surgical technique and well published longer-term outcomes, while other surgeons prefer other, more complex procedures ranging from stem cell therapies to platelet-rich plasma and collagen sponges. We

were delighted to read this updated report of a previously reported, randomised controlled trial comparing autologous chondrocyte implantation (ACI) to microfracture. Last reported at mid-term (five-year) follow-up, this cohort did not previously show an advantage to the ACI approach, and we were very pleased to see that these investigators have published their long-term results. The initial cohort consisted of 80 patients, all with an isolated symptomatic cartilage defect, randomised to one treatment or

another. Outcomes were assessed using the International Cartilage Repair Society, Lysholm, SF-36, and Tegner scores along with objective weight-bearing radiographs. The bottom line — perhaps surprisingly — is that at long-term follow-up there were no differences between the two groups with regard to the clinical scores. However, there was a higher rate of failure in the ACI group (17 vs 13 patients) and more patients subsequently required total knee arthroplasty (6 vs 3 patients). However, those patients for whom



treatment was effective appear to have gone on to have long-term success with significant improvements in scores relative to baseline. The message here is perhaps somewhat confusing, nevertheless it appears that, when successful, microfracture and ACL are equally effective in the long-term and about equivalent. While the study team raise some concerns about the failure rate of the ACL being higher than that of microfracture, chondrocyte implantation technology has definitely moved on somewhat in the last 15 years, and this paper certainly serves as proof of concept: when it works, it appears to work at least moderately well.

Hybrid and cemented revision knee comparable in revision knee arthroplasty X-ref

■ The difficulty with radiostereometric analysis (RSA) studies is in knowing how to interpret the results. The method is sensitive for early subsidence and loss of fixation of components, for estimating wear rates, and has been used as an early surrogate marker for failure of components. One of the tricky things is that the components usually have to be modified to carry the tantalum markers. It is rare to see comparative RSA studies and, as such, only inferences can be made about the potential success or otherwise of the implant in question. We were delighted to come across this comparative study from **Nijmegen (The Netherlands)** where the group set out to compare

the potential benefits of different fixation strategies following revision knee arthroplasty in a randomised controlled trial, using RSA as an outcome tool.² A total of 32 patients were randomly allocated to either cemented or hybrid (uncemented) stem fixation, and RSA radiographic measures were taken at regular follow-up to 24 months. In addition to reporting migration in all degrees of freedom, the investigators also reported clinical outcomes using a variety of outcome scores. Despite the accuracy of RSA as a technique and the gamut of outcome measures selected, there were no differences in any outcome measure at 24 months, however, perhaps surprisingly, there was an incidence of around one third of patients demonstrating subclinical micromotion of $>1^\circ$ or 1 mm of motion, despite the absence of radiographic loosening. It would appear that despite the unexpected incidence of instability, both methods of fixation are equally successful even when assessed using the most exacting radiographic and clinical outcomes possible.

Sonication better than tissue for molecular methods X-ref

■ The push for a 'gold standard' in tissue diagnosis of periprosthetic joint infection continues to produce more and more research papers with proponents of new technologies continuing to produce evidence to support their use. Sonication is the use of ultrasound to agitate prosthesis and tissue taken from patients with a suspected periprosthetic infection, followed by the use of either traditional culture or molecular diagnostic methods on the resulting 'sonicate'. A study from **Izola (Slovenia)** would seem to suggest that there is some mileage in the use of sonication, with a reported series of 87 patients all undergoing revision arthroplasty.³ The samples taken in theatre were all analysed using the polymerase chain reaction (PCR) technique, specifically aimed at the 16S gene. The authors diagnosed infection

in 27 patients using the sonication method, while this was positive in just 22 cases when using the traditional tissue methods. Interestingly, in six of seven patients with a positive sonicate, the culprit was a low virulence bacteria. Despite some mixed literature surrounding the benefit or otherwise of sonication, it appears that, in this series at least, a positive benefit was definitively seen with the addition of sonication to the usual battery of microbiological tests. We do not think it will be long before the inclusion of sonication in laboratory analyses becomes the 'standard of care' for diagnosis of periprosthetic joint infection.

VAPOUR: osteoporotic spine fractures under the spotlight X-ref

■ It is rare for orthopaedic studies to be printed in the *Lancet*, so we were excited to read this study from **Sydney (Australia)** where the authors have reported their randomised controlled trial of vertebroplasty *versus* placebo.⁴ The trial reports the outcomes of 120 patients, all with painful acute vertebral fractures seen within six weeks of presentation. The patients were randomised to either treatment or placebo and all had numeric rating scale (NRS) back pain scores of 7 in 10, or greater, prior to enrolment in the study. Outcomes were assessed using an intention-to-treat principle and NRS pain scales, with the primary outcome measure being the proportion of patients with an NRS score < 4 at 14 days post-operatively. There was a marked difference between the groups with regard to the primary outcome score, with 44% of patients in the vertebroplasty group having pain scores of < 4 as compared with 21% in the placebo group. Vertebroplasty is a relatively benign procedure and although significant, complications are reported in the literature including cement extravasation and thermal injury, though they are few and far between. This study clearly demonstrates that significant

improvements in pain outcomes can be expected in patients offered vertebroplasty following a painful osteoporotic spinal fracture.

Tranexamic acid find for oral administration X-ref

■ There is now no debate that the use of tranexamic acid during total joint arthroplasty reduces bleeding complications including transfusion. There are a number of randomised and non-randomised trials which demonstrate this to be the case. Interest has now turned to the administration route; there are a number of studies that have compared topical with intravenous administration with surprisingly little difference. Investigators in **Chicago, Illinois (USA)** have perhaps taken this approach to its logical conclusion and their randomised controlled trial (RCT) was designed to establish if the route of administration really needs to be parenteral or if oral administration will suffice.⁵ Their study randomised 71 patients to either oral administration (1.95 g, two hours pre-operatively) or intravenous (IV) administration (1 g prior to wound closure). The primary outcome measure was the post-operative haemoglobin and the study itself was powered only for equivalence. There were no differences in the primary outcome measure, with a mean drop of 3.45 g/dL in the oral group and 3.31 g/dL in the IV group. There were few differences in total recorded blood loss, and a single patient in each group required transfusion. However, the difference was clear to see regarding the cost, with oral formulations reported as being up to \$90 cheaper than the IV preparation. This paper is a nicely executed study which seems to suggest that there is an equivalent and cheaper option to IV preparations – certainly something to at least make one pause for thought.

NSAIDs perhaps not so safe

■ There have been some worrying reports of problems with non-steroidal anti-inflammatory

drugs (NSAIDs) and cardiac toxicity over the past decade. As one of the chief prescribers of these medications, it is certainly worth bringing this large-nested case control study which aims to estimate the risks for cardiac failure of the major commonly used NSAID to attention. The authors utilised five population-based healthcare databases from the **UK, Germany, Italy and The Netherlands**.⁶ In what must be one of the biggest datasets ever to be reported, over 92 000 admissions for cardiac failure were matched with 8.2 million controls with the aim of establishing the risk of heart failure associated with 23 NSAIDs and four COX-II inhibitors. Perhaps nobody will be surprised to find that these drugs do indeed appear to increase the risk of cardiac failure with a 19% increased risk associated with recent use of an NSAID. This effect was seen with all commonly prescribed NSAIDs. Although the authors do comment that, due to the wide-ranging nature of this analysis, some confidence intervals are wide, this paper is as damning as it is conclusive. NSAIDs are associated with cardiac failure, and we should perhaps stop thinking of these as 'safe' medicines.

Overconstraint with the anterolateral ligament X-ref

■ Are we falling into the same trap again? Picking up on the new fad without evidence? Anterolateral ligament (ALL) reconstruction is all the rage in sport surgery camps, and

like all things 'new', it seems that now everyone is doing some kind of extra reconstruction. Researchers in **Vail, Colorado, (USA)** have set out to establish what, if anything, is the benefit of additional reconstructions.⁷ Their hypothesis was that *all* reconstruction would offer increased rotational stability to the knee. They undertook a cadaveric study using ten fresh frozen specimens. Each knee underwent a kinematic assessment within a range of states. Initially the intact knee was tested, then progressive reconstructions were undertaken:

- Anatomic single-bundle repair (ASBR) with intact ALL
- ASBR with divided ALL
- ASBR with ALL reconstruction in angles ranging from 0° – 90°
- Unreconstructed knee

The results were surprising; it appears that the reconstruction of the ALL resulted in overconstraint when the knee was flexed beyond 30° in terms of internal rotation in all graft positions. The authors quite rightly caution that before this trend is more widely adopted, some further work is clearly required here. Overconstraint of the knee will have implications for long-term degenerative change, as well as potentially resulting in impaired function.

Polyurethane scaffolds for meniscal tears? X-ref

■ Meniscal scaffolds can be used in cases of a meniscal tear or previous partial meniscectomy, with the logic being that painful irreparable

meniscal defects - given time - lead to further tears, increased contact stresses in the knee joint, and ultimately to degenerative change. The concept is that the use of a biodegradable scaffold will result in the right patient in biointegration and improved functional outcomes. Of course, given the relatively poor results of meniscal repair itself in the medium to longer term, particularly in the older patient, many surgeons have treated polyurethane scaffolds with some considerable cynicism. A team from **Ghent (Belgium)** have reported their own experience of polyurethane scaffolds used in a relatively large number of patients and followed up over five years.⁸ The surgical team implanted 44 scaffolds for irreparable partial meniscal defects. The outcomes were assessed in terms of survival of the implant and functional outcomes. The authors report a five-year survival of just 62% and a stable cartilage status on MRI scan of a worrying 47%, perhaps reinforcing the belief in many surgical quarters that these implants are rarely indicated and have poor success even in the short term. However, when it works it does seem to improve knee function with significant clinical improvements in visual analogue scale, and knee injury and osteoarthritis KOOS scores maintained over the five years of the study.

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