

# ROUNDUP<sup>360</sup>

## Knee

**Xref** For other Roundups in this issue that cross-reference with *Knee* see: [Hip & Pelvis Roundup 1](#); [Oncology Roundup 2](#); [Research Roundups 3, 4 and 5](#).

### Mobile compression as good as chemical thromboprophylaxis? **Xref**

■ Thromboembolic disease continues both to stir debate and stimulate research and development into new therapies. A relatively recent innovation is the development of mobile compression devices to reduce the risk of venous thromboembolism (VTE) in post arthroplasty patients. Offering the advantage of continuous wear and no inhibition of mobilisation, unlike the traditional pneumatic compression stockings, they offer a potential alternative to, or adjunct for, pharmacological interventions. Researchers in [La Jolla \(USA\)](#) designed and conducted a multicentre registry study with the aim of evaluating the effectiveness of a mobile compression device (with or without aspirin) compared with current pharmacologic agents when used for prophylaxis against venous thromboembolism. The study population was patients undergoing primary total hip replacement or total knee replacement and the end point was symptomatic VTE. All patients utilised the mobile compression device for ten days after discharge from hospital. Patients presenting with symptoms suggestive of deep venous thrombosis or pulmonary embolism were appropriately investigated and treated. Of note, this study

was designed as a non-inferiority study with a 1.0% margin. The study population consisted of 3060 patients with a less than 1% event rate ( $n = 28$ ). Of these, there were 20 distal DVTs, three proximal DVTs and five pulmonary emboli. The authors report a single death but no post mortem was performed.<sup>1</sup> The authors conclude that the VTE rates with the mobile compression device were non-inferior to the reported rates with multiple pharmacologic protocols, except knee replacement with rivaroxaban. This is an intriguing study given that one of the major concerns with aggressive chemoprophylactic protocols is bleeding. Use of a mobile compression device appears to mitigate such a risk. While this is reassuring data, the study is a non-inferiority investigation and further multicentre, randomised controlled trials are required.

### Patellar injury with MIS knee surgery

■ Minimally invasive surgery has been very much in vogue across all surgical disciplines in the past decade, an attractive option for patients and physicians alike, with small scars and minimal tissue disruption potentially leading to faster rehabilitation and better outcomes. However, despite the advantages on the surface, there is precious little evidence to support its use, and some would argue that the minimal exposure can result in poorer outcomes. In the world of knee replacement debate has surrounded the concept of MIS arthroplasty. As part of this debate,

there have been questions raised as to the relevance of patellar subluxation *versus* eversion in total knee replacement. The collaborative authors of this study from [London \(UK\)](#) and [Perth \(Australia\)](#) should be commended on their well-designed and well-executed randomised controlled trial comparing the short-term results of patellar subluxation with eversion during total knee replacement. The authors enrolled 68 patients undergoing total knee replacement using a standard open approach with either patellar eversion or subluxation. Outcomes were assessed at three months and one year post-operatively. The authors found no difference in flexion, Oxford Knee Scores, SF-12, or visual analog pain scores between the two groups. However, they did note a significantly greater percentage of lateral tibial overhang in the subluxation group. Moreover, there were two partial patellar tendon divisions in the subluxation group, but none in the eversion group.<sup>2</sup> This study very nicely demonstrates no clinical benefit to patellar subluxation, but rather an increased risk of damage to the patellar tendon and decreased visualisation of the lateral compartment, leading to an increase in implant malpositioning.

### Tibial plateau fracture results not as good as we thought

■ Tibial plateau fractures can be some of the most challenging to treat intra-articular fractures. The nature of the injury, and difficulties gaining good access to the posterior and

central portions of the joint, have led to mixed reports of success in the literature and to a myriad of publications. Despite this, there has been significant interest from traumatologists and knee surgeons alike, and a widespread recognition that operatively treated tibial plateau fractures can predispose to post-traumatic arthritis and subsequent requirement for a total knee replacement (TKR). In spite of this, the risk of TKR after open reduction and internal fixation is poorly defined. A study team in [Toronto \(Canada\)](#) sought to more clearly define the rate of TKR after tibial plateau fracture fixation. They designed a large cohort comparison study to compare the rate of post fracture arthrosis with the rate in the general population. They identified 8426 tibial plateau fractures and 4:1 matched these patients with 33 698 controls with matching based upon age, sex, income, and urban/rural residence. In this impressive study which is the largest on the topic to date, and after adjusting for comorbidities, the authors found that tibial plateau fracture repair increased the likelihood of TKR 5.3 times compared with the background population. Despite this increased odds ratio, the absolute event rate (TKR incidence), however, was fairly low with only 7.3% of patients with a tibial plateau fracture requiring a TKR by ten years after fixation.<sup>3</sup> While heartening in terms of absolute numbers, this study casts light on the significantly increased risk for TKR after an operatively treated tibial plateau fracture.

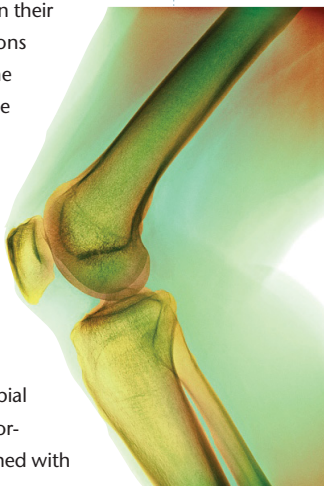
## Back and knee pain: a bad combination [Xref](#)

■ It is not uncommon to have patients presenting with multiple musculoskeletal complaints. The difficulties distinguishing hip and knee pain from spine and hip pain are well documented. In the confusing clinical scenario of a patient with back problems as well as large joint lower limb complaints, decision making is complex and providing the correct advice even more so. Patients with spinal deformity are likely to benefit from correction of this first (as correction of pelvic obliquity often ameliorates symptoms and alters lower limb axis). What, however, should the orthopaedic surgeon do when faced with a patient with simple back pain and knee arthritis? Given that around 20% of patients are unsatisfied with their total knee replacement (TKR) and that many patients present to their orthopaedic surgeon with back pain as well, the authors of this study from [Edinburgh \(UK\)](#) sought to determine if back pain was an independent predictor of poor prognosis. They included 2392 patients in their prognostic study and used patient reported outcome measures (Oxford Knee Score (OKS)) as their primary outcome. Data were collected from a local replacement register containing diagnostic, demographic and outcome measure information. The authors identified an incidence of back pain reaching 35% (n = 829) in their patient population. Patients with back pain were more likely to be female (Odds Ratio (OR) 1.5), have a greater level of comorbidity, a worse pre-operative OKS (2.3 points), and a poorer SF-12 score. After adjusting for confounding variables by one-year follow-up, concomitant back pain was an independent predictor of a poorer post-operative OKS (5 points), and of dissatisfaction with the procedure (odds ratio 0.62).<sup>4</sup> Recognition of the poor prognosticator of back pain is essential and, as such, clinicians would do well to routinely question patients about the presence of back pain, and may

consider spinal referral or intervention prior to TKR. Even if this is not clearly indicated based on the results of this study, it would be prudent to counsel patients with back pain that their outcomes are less likely to be satisfactory after TKR.

## Metaphyseal sleeves may be the answer in revision knee replacement

■ In the setting of an ageing active population, many of whom have undergone primary total knee replacement (TKR) in their sixties, surgical options to address poor bone stock in revision knee replacement are becoming more and more important. More and more surgeons are looking for options that allow for bony ingrowth, particularly in the tibial metaphysis where torsional forces combined with large cavitary defects can lead to early failure in cemented options. An attractive option that has become available relatively recently is that of the uncemented metaphyseal tibial sleeve with the option for bony ingrowth. Reconstitution of the metaphysis during revision TKR is of paramount importance, and while it has recently become obvious that the use of uncemented metaphyseal components that have the potential for bony ingrowth are of benefit, there is a paucity of evidence to support their use. Surgeons in [Cardiff \(UK\)](#) have reported one of the only large series evaluating this option. The surgical team reported a prospective consecutive case series (Level III evidence) detailing their experience with a cementless metaphyseal metal sleeve in 104 revision knees. They were able to report good osseointegration and significant improvements in clinical outcome scores at a mean follow-up of 43 months. By final follow-up, the authors had achieved good osseointegration in 102 patients, and



two revisions had been re-revised for early loosening. Oxford Knee Scores improved from an average of 23 to 32, an encouraging early series.<sup>5</sup> It is essential to point out that an alternative option to such a technique is the newer porous tantalum metaphyseal cones. These cones allow for 'bony through growth' with a porosity and surface characteristics similar to metaphyseal bone. The benefit of such cones is that they may be utilised with a variety of implant designs, and have

a highly porous surface which the surgeon can directly oppose to bone. Porous tantalum cones allow for hybrid fixation with cemented stems offering the tantalising combination of immediate fixation, while the cones obtain bony ingrowth.

## Oral tranexamic acid

### as good? [Xref](#)

■ The use of tranexamic acid in lower extremity total joint replacement has gained significant attention recently. There are multiple publications which have described the efficacy of tranexamic acid in decreasing blood loss and reducing the number of post-operative transfusions. The majority of these studies have focused on the IV administration of tranexamic acid, and there is minimal data on oral administration. An arthroplasty team in [Wansbeck \(UK\)](#) report their study on oral *versus* IV tranexamic acid administration. This was undertaken as part of their work on an enhanced recovery pathway and reports the results in around 3000 procedures. The authors report their experience during a national shortage of IV tranexamic acid of switching from IV to oral administration. They report on the safety and efficacy of tranexamic acid in the surgical

setting in a 'natural experiment'.

Their study includes 2698 patients who received IV tranexamic acid and 302 who received an oral preparation. Patients were undergoing either knee or hip replacement and efficacy was measured by transfusion requirement along with comprehensive evaluation of the safety profile (length of stay, rate of readmission, return to theatre, deep infection, stroke, gastrointestinal bleeding, myocardial infarction, pneumonia, deep-vein thrombosis and pulmonary embolism).<sup>6</sup> The authors found that the odds ratio of receiving a blood transfusion was significantly higher with IV tranexamic acid when compared with oral tranexamic acid (odds ratio 0.48). However, the readers should be cautioned when interpreting these findings, as there was a significant mismatch in cohort size. While the authors have effectively demonstrated that tranexamic acid is safe orally, a question remains over the improved efficacy. By necessity, oral tranexamic acid will have been administered at a different time point to the IV formulation. Is it the timing of administration or the method of administration that is the factor at play here?

## Gentamycin alone sufficient in antibiotic spacers

■ Successful treatment of recalcitrant infection in total joint replacement is often achieved with two-stage revision and the use of a cement spacer. Although single-stage revision has been previously shown to have equivalent results in terms of eradication of infection, proponents of two-stage with spacer strategy argue that the continued delivery of antibiotic potentially gives higher cure rates and the use of the spacer offsets any soft-tissue shortening or stiffness. Recent developments include the use of gentamycin and vancomycin in combination in commercially available spacers. There is a scarcity of studies to support this strategy, and we welcome this report from investigators in [Barcelona \(Spain\)](#) describing their comparison of pre-fabricated

spacers with either gentamycin alone or in combination with vancomycin in both hip and knee replacement.<sup>7</sup> The study team were able to include 51 patients treated arbitrarily with either gentamycin alone or gentamycin and vancomycin. During the period of the study the institution changed standard of care to include vancomycin in their pre-fabricated spacers. The research team investigated end points of infection control and complication rates and, slightly unusually for an antibiotic efficacy study, satisfaction rates and quality of life scores. Follow-up was to 12 months. The investigators managed to achieve an infection control rate of 83% which is slightly behind some other series reported in the literature, however, they were unable to find any significant differences between the two spacers in terms of eradication rates (80% vs 85%) or any other outcome measure. While vancomycin addition did not seem to increase complication rates as the authors comment “higher costs involved with vancomycin and gentamicin spacers, and the potential risks of unselective use of vancomycin”, there are a number of potential disadvantages.

### Jury still out on unloader braces

■ When undertaking articular cartilage repair there has been a recent vogue for use of unloader

braces, the rationale being that use of a varus or valgus brace would allow the early mobilisation required for a good outcome but without the potentially deleterious effects of load bearing through the knee. Researchers in **Perth (Australia)** set out to establish what the loading effects of these braces actually are, not in an experimental or treatment model, but in healthy knees. The research team set out to examine the effects of varus and valgus offloading in the knees of 20 healthy volunteers. Using a single commercially available brace, adjustments to the varus and valgus unloader were possible and gait analysis was performed. The study measured spatiotemporal variables as well as knee adduction moments and muscle activation during stance. The analysis was performed on a group difference basis, rather than investigating individual differences. The research team were unable to identify any differences between the braced and unbraced knees or any condition of bracing in kinetic or muscle activity parameters. However, both varus and valgus bracing increased the activation of muscles responsible for lateral moment arms but this difference, while marked, was not significant. The authors conclude that their results reveal inconsistencies in the changes of knee kinematics and muscle activation strategies between individuals and that although this was

a pilot study using healthy volunteers, they were unable to explain why both valgus and varus bracing had the same effect of increasing knee adduction moments and a more laterally directed muscular activation profile.<sup>8</sup> These results are slightly at odds with another recently published paper<sup>9</sup> on the topic from researchers in **New York (USA)** where a different study methodology was used to investigate the effects of valgus unloading braces only on a group of healthy individuals. The research team investigated the effects of an off-the-shelf adjustable valgus unloader brace. Gait analysis was utilised to investigate frontal and sagittal plane knee angles and external moments. This research team found that with increasing tension in the brace, frontal plane knee angle was significantly affected (from 1.6° varus to 4.1° valgus). Peak knee adduction moment and knee adduction impulse also, as would be expected, decreased with increasing brace tension. This study team, despite a slightly less comprehensive methodology, identified the expected effect from the valgus unloader brace. The jury, it appears, is still out.

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