

# ROUNDUP<sup>360</sup>

## Knee

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

### Iodine washout: chondrotoxic or antiseptic?

■ While it is not unusual to find conflicting or complimentary papers published around the same time or even in the same issue, it is rare for a paper to garner so much controversy that a direct response (and in this case with a conflicting message) is published just a few months later. Never being ones to shy away from controversy, we were delighted to include both papers in this edition. Initially, researchers in [New York \(USA\)](#) set out to establish if the change of practice for the senior author (that of introducing a dilute betadine washout) had resulted in a lower infection rate. The authors report that a protocol of dilute betadine lavage with 0.35% betadine for three minutes was introduced in June 2008 in an attempt to reduce the post-operative infection rate. Prior to introduction of the washout protocol the senior author performed 1862 consecutive cases (1232 TKR and 630 THR) in which there were 18 early infections (within 90 days). Following the change of protocol, 688 cases were performed (414 TKA and 274 THR) with a statistically significantly lower infection rate (0.97% versus 0.15%). The authors were unable to establish any significant differences

in demographics or other parameters between the two groups and concluded that betadine lavage before closure was an effective and inexpensive way of reducing early post-operative infection rates.<sup>1</sup> Researchers in [Boston \(USA\)](#) felt so strongly about the concept of washing out a native joint with even dilute betadine that they immediately set out to establish what effect this might have on chondrocyte viability, and were able to report their results within three months, perhaps a record turnaround for laboratory-based research. The study team identified 42 bovine cartilage explants and exposed them to different concentrations of povidone for time periods of one, three or six minutes, as well as to a saline control. The cartilage samples were assessed using the Alive/Dead cytotoxic assay for potential cytotoxic effects. They were able to demonstrate that the measured chondrotoxicity was directly related to the time and concentration of exposure. While the 0.35% betadine solution was the least chondrotoxic of all the solutions, there was still a measurable chondrotoxic effect when exposure lasted for more than a minute.<sup>2</sup> We are not wholly certain we share the concerns raised by the Boston team. While we would shy away from betadine washout in native joints without arthritis, this data is only really applicable in unicompartamental knee replacements where native articulating cartilage is left post-operatively. Certainly on

a risk benefit analysis it is difficult to argue against a nearly ten-fold reduction in infection rates in favour of a hypothetical risk of cartilage damage, particularly in total joint replacement when little cartilage is left behind in any case.

### Stem tip pain following revision knee replacements

■ Ongoing symptoms, especially pain, can be a typical problem following revision arthroplasty surgery. One particularly difficult problem to resolve can be 'stem tip' pain, which is a well-recognised but rare condition where the stem of a TKR causes an abnormal stress concentration in the tibial shaft and subsequently the patient experiences pain (often accompanied by remodelling changes in the shaft of the tibia). Never letting common sense get in the way of a good idea (or clinical data for that matter), a team of enthusiastic aerospace engineers in [Guildford \(UK\)](#), recognising that tibial stress concentration is one (of many) possible explanations for stem tip pain, constructed a finite element analysis model. They successfully demonstrated an increase in tibial stress at the tip of the tibial stem. Reasoning that cortical plates are known to alter stress concentration, they built a plate into the model, and should some pioneering surgeon somewhere wish to re-operate on a patient complaining of stem tip pain then this paper will clearly tell you what plate to apply and where.<sup>3</sup> We here at 360 are not quite of that pioneering spirit yet.

### Metalwork removal prior to total knee replacement?

■ Many patients undergoing planned TKR have had previous surgery (such as ACL reconstruction, high tibial osteotomy, tibial plateau fixation, etc.) and it is not quite clear if these patients should have their metalwork removed or not. Some argue that if not interfering with the TKR then old metalwork should be left; others argue it may act as a nidus for infection. Surgeons at the world-renowned ENDO-Klinik in [Hamburg \(Germany\)](#) have been able to shed some light on the matter, due (we are sure) in part, to the large volumes of TKRs undertaken at the unit. They have been able to report on a retrospective series of 124 primary TKRs in patients who had previous knee surgery with an implant of any variety. In all cases patients underwent synchronous TKR and removal of metalwork at a single sitting. Using this technique the surgeons were able to achieve early post-operative infection rates of just 0.9% with an impressive five-and-a-half-year follow-up. They obtained both pre-operative aspirates (in 42.4%) and intra-operative samples (84.8%) in selected patients, none of which were positive.<sup>4</sup> The authors are pretty certain, based on these results, that their approach of single-stage procedure without a specific pre-operative sampling regime is justified, and we have to say we are inclined to agree with them.

## Astroturf and ACL rupture

■ Astroturf (or artificial grass) is a controversial playing surface. Offering all-year-round standardised pitch conditions, athletes, coaches and surgeons are divided about the risks of injury the various varieties of 'plastic grass' pose to players. A surgical team set out to establish if those playing on astroturf are at higher risk of ACL rupture than those practising on a real field. Using college football as a model the research team in **Palo Alto (USA)** used data collected as part of the National Collegiate Athletic Association (NCAA) Injury Surveillance System (ISS). Using search terms compatible with ACL injury over a five-year period (2004–9), the research team sought to establish the effect of playing surface on risk of ACL rupture. The investigators were able to estimate the overall risk of ACL injury at 1.73 injuries per 10 000 athlete exposures on artificial playing surfaces which was significantly higher than the 1.24/100 000 athlete exposures seen on grass. With a nearly 40% excess risk of injury and a higher rate of non-contact injuries (44% versus 36%), extra care should be taken when athletes play on artificial surfaces, and where possible for those at risk of injury it should be avoided.<sup>5</sup>

## Robert Jones dressings: back in?

■ Sometimes it is the simplest questions to which we do not have an adequate answer, and so it is with dressings following TKR. It has been standard practice for many years to place a compression dressing in the immediate post-operative period following TKR. In other units this is not standard practice. Sensing the opportunity to sort the wheat from the chaff, a research team in **Pathumthani (Thailand)** designed a randomised controlled trial to test the hypothesis that a compression dressing ('Robert Jones bandage') used after TKR reduces blood loss, pain and swelling. They enrolled 60 patients undergoing TKR to the study. Thirty

were randomised to the Robert Jones bandage and 30 to a conventional dressing. Randomisation occurred after wound closure. Compression dressings were applied for 24 hours and blood loss assessed using the contents of vacuum drains. Secondary outcomes were assessed using pain scores, assessment of knee swelling and units transfused in the post-operative period. The study team established no difference in the mean post-operative blood loss (418 ml versus 467 ml). There were also no assessable differences in secondary outcome measures of blood transfusion incidence, pain or knee swelling between the two groups.<sup>6</sup>

This elegant, simple and straightforward study has highlighted for us the amount of 'history' and arbitrary decision making behind a lot of what we do in orthopaedic practice. As there appears in a well conducted randomised controlled trial to be no difference in outcomes between patients receiving the Robert Jones dressing and those who did not, we would see good reason for changing practice in those units still using them.

## Thicker gloves are no safer

■ We all agree that infection for the patient is probably the worst outcome of surgery, possibly withstanding infection of the surgeon which is a significant but rare risk. Of course, operative gloves protect against both, and it has been common practice in orthopaedics to 'double glove' to protect against both of these catastrophes. Almost unique in TKR is the use of an unguarded power saw for large portions of the operation. These, combined with sharp bone and instruments, make glove perforations a common occurrence. Surgeons in **Seoul**

(**South Korea**) have conducted a randomised controlled trial to establish whether or not the use of thicker surgical gloves would reduce the perforation rate and therefore the risk of contamination. Operative staff performing 70 serial TKRs were randomised to either 'thick' or 'standard' gloves at the beginning of the surgery. Outcomes were assessed by comparing the number of inadvertent glove perforations. Secondary outcomes of sensitivity (as measured

by two-point discrimination) were also recorded. Overall there were 1120 gloves assessed across 70 TKR surgeries. Of these 70, at least a single perforation occurred in nearly 40% of cases, but in less than 5% of gloves. The study team demonstrated that the operating surgeon was the only risk

factor for glove perforation (odds ratio up to 14.4), while the type of glove in itself was not. However, the thicker surgical gloves lowered two-point discrimination significantly. Given the lack of additional protection offered by the thicker surgical gloves and the reduction in two-point discrimination, the authors do not recommend the use of thick gloves routinely.<sup>7</sup> Here at 360 we are still aghast that some surgeons are over 14 times more likely to perforate their own glove than others!

## The long leg radiograph: is it still the gold standard?

■ In this age of technological wizardry and easy access to total body CT scans, the venerable old 'long leg film' has been somewhat overlooked in the literature of late. That said, it remains the gold standard imaging modality for the majority of orthopaedic arthroplasty surgeons the world over. Researchers in **Melbourne (Australia)**

have refocused our attention here at 360 on this traditional method for defining the mechanical and anatomical axis of the lower limb. The research team undertook a prospective diagnostic study by comparing pre-operative long leg radiographs with CT scanograms and intra-operative computer-aided navigation. They used a consecutive cohort of 40 patients as their study population, all of whom had all three imaging modalities. In all cases there was excellent intra-observer correlation coefficient (> 0.98) with a variability of < 1.1°. A similar picture was seen with inter-observer correlation (> 0.960 long leg films and > 0.970 CT). In this case, variability with repeated measures was < 2.8°. Interestingly, the long leg radiographs and CT were more concordant with each other than either was with the computer-aided navigation (> 0.893 versus > 0.643 and > 0.671, respectively). Given the widespread availability of long leg films and their almost indistinguishable measurements from CT scanogram films, the authors recommend that long leg films remain the gold standard.<sup>8</sup> While this study does not shed any further light on which modality (CT or computer navigation) is the most accurate, it does appear, at least, fairly clear that long leg films agree with CT scanograms. Long live the venerable long leg film!

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