

Research

X-ref For other Roundups in this issue that cross-reference with Research see: *Shoulder & Elbow Roundup 6; Trauma Roundup 8.*

Surgical margins and sarcomas x-ref

■ There is little in the way of controlled data on surgical excision margins and outcomes in sarcomas, however, it remains potentially one of the most important determinants of outcomes. Researchers in **Corvallis, Oregon (USA)** add some important information in their study of excision of feline injection site sarcomas.¹ The authors studied the effect of processing of widely excised injection site sarcomas from client-owned cats. The study examined the excision margins in all four directions during the processing of the samples from five cats. In what is quite an interesting study, the authors identified significant decreases in surgical margin length immediately following excision (prior to formalin fixation). Formalin fixation, trimming, and mounting on slides did not result in additional significant changes in length. Subgross evaluation of tumour-free margins from on-slide grossly normal surgical margins to histologic tumour-free margin overestimates the actual (histologic) tumour-free margins. The authors established that the change in grossly normal surgical margins was a decrease of 33% following processing, of which 29% occurred after excision.

Fluoroscopic radiation exposure to the breast

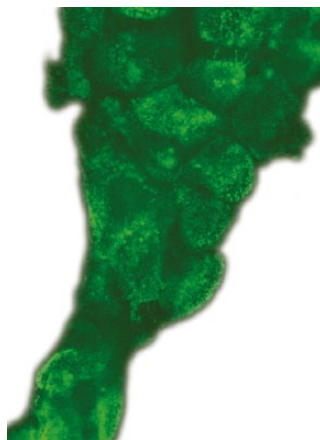
■ In a concerning study from **San Francisco, California (USA)**, the authors have noted that there was an increased incidence of breast cancer in female orthopaedic surgeons compared with the wider population.² There are a few explanations as to why this might be. The research team used an anthropomorphic torso phantom, simulating the female surgeon, placed adjacent to a standard operating table. The

radiation exposure was recorded using dosimeters placed over the upper outer quadrant (UOQ) and lower inner quadrant (LIQ) of the breast, bilaterally. Scatter radiation dose-equivalent rates were measured during continuous fluoroscopy to a pelvic phantom. There was a higher radiation dose to the upper outer quadrant *versus* the lower inner quadrant (0.40 mrem/hr vs 0.06 mrem/hr). This paper suggests that the whole body is not perfectly protected from radiation exposure and the position of the C-arm influenced the dose of radiation exposure, with higher doses seen in the lateral position. Although this is far from conclusive, the authors here have flagged up a significant potential risk of poorly fitting lead jackets.

Frailty and surgical survival

■ There has been an increasing index in measures of frailty as the population ages, and adjusted outcome measures for comorbidity are becoming the norm. Researchers, clinicians and healthcare funders are all looking to adjust outcomes from frailty. There are a number of potential ways to identify those who are frail, and outcomes are starting to be adjusted by frailty. One of the more difficult things to do has been to identify patients who can be treated for frailty and what treatments should be for these frail patients. The national Frailty Screening Initiative (FSI) in the United States is a widely introduced initiative in the field of geriatric medicine. A report from **Omaha, Nebraska (USA)** sets out to establish if there are any potential advantages to this initiative

in surgery.³ Their study reports on the outcomes of 9153 patients from a level 1b Veterans Affairs medical centre, all of whom presented for elective non-cardiac surgery over a seven-year period. The study period spans the introduction of the frailty assessment initiative which occurred at the midway point of July 2011. Frailty assessment was performed with the Risk Analysis Index (RAI), and records of patients with an RAI > 21 had a senior clinical review prior to surgery with the appropriate input from surgery, anaesthesia, critical care, and palliative care prior to undertaking the operation. Over the course of the study period (fol-



lowing initiation of the frailty screening tool), there was an observed drop in 30-day mortality from 1.6% to 0.7%, which was significant. The bulk of this improvement was seen in the more frail patients (12.2% to 3.8%), both changes were significant. The authors went on to undertake some multivariable modelling and established that the widespread screening of patients for frailty when taking into account other potential confounders yielded an adjusted odds ratio of 2.87.

Thromboprophylaxis not effective in arthroscopy or lower-leg casting x-ref

■ The use of prophylaxis in the prevention of post-surgical thromboembolism is here to stay. There is a reasonable consensus of opinion that in high-risk patients undergoing major surgery, thromboprophylaxis as an inpatient, and on occasion as an outpatient, is a reasonable therapeutic option. There are, however, very few studies

supporting or rejecting treatment with low-molecular-weight heparin (LMWH) in lower-risk patients. These authors from **Leiden (The Netherlands)** report two related and interesting trials in the same article: POT-KAST (patients undergoing knee arthroscopy) and POT-CAST (patients treated with casting of the lower leg).⁴ In both studies, around 1450 patients were included on an intention-to-treat basis and had been randomised to either a prophylactic dose of LMWH and further cover for eight days in the case of arthroscopy, or the length of plaster immobilisation. The studies were open-label pragmatic studies with a blinded analysis. The outcome of interest was symptomatic venous thromboembolism, with no difference in the event rates between intervention and control groups in either study. This is, to our knowledge, the only well conducted randomised controlled trial which reports a comparison of symptomatic venous thromboembolism in arthroscopy and plaster immobilisation. The studies are relatively conclusive in failing to demonstrate a treatment effect of LMWH in preventing symptomatic venous thromboembolism.

How do we spend our time?

■ There is surprisingly little known about how doctors spend their time when treating patients in ambulatory care, in particular the make-up of the time spent – how much is actually employed on patient care and how much on associated tasks. Still less is known about how this varies from specialty to specialty. In a very simple but enlightening study, researchers in **Hanover and Lebanon, New Hampshire (USA)** set out to ascertain just what it is we do at work.⁵ This was a time-and-motion study (directly observed) during office hours and a diary study during after-hours work, and included 57 doctors with specialties

in general practice, cardiology, general medicine and orthopaedics. There were 430 hours of observation which were broken down by the research team into direct clinical care, electronic health record and desk work, administrative tasks, and other tasks. During the day, clinicians spent only a quarter of their time on direct clinical care, with around half in supporting electronic records and desk work. This was slightly improved in clinic, with around half of the time spent on clinical contact time, but even in the clinic a third was spent on what essentially amounts to clerical tasks. Clearly, the results will vary somewhat from system to system and hospital to hospital, however, the finding that each clinical care hour is matched by nearly two additional hours spent on electronic health records and desk work is eye-opening but not surprising. The burden of additional IT systems and paperwork is continually expanding and certainly doesn't look like getting any easier over the next few years.

Predicting the onset of knee OA x-ref

■ Although a lot is known about degenerative change in the large joints, one of the difficult clinical questions to answer is 'when will it get worse Doctor?'. The heterogeneous group of conditions that makes up knee arthritis does not really give a reliable clinical course and some patients will rapidly progress to end-stage arthritis and require knee replacement, whilst others may take many years over the same progression. There have been studies using MRI scanning

and plain film radiographs which aim to identify those patients who might progress or are in the process of progressing towards significant arthritis. However, to our knowledge, little is known about ultrasound of the meniscus as a potential prognosticator. These authors from **Tottori (Japan)** have investigated the potential for ultrasound to be used as an early investigation and prognosticator for the progression of osteoarthritis.⁶ Arguing that medial meniscal displacement has been associated with progression of osteoarthritis due to increased contact forces and dysfunction of the meniscus, these authors investigated the progress of arthritis and meniscal displacement in 46 Japanese patients over a five-year period. The research team enrolled 55 patients into the study, 46 of whom completed all follow-up. The study population contained 32 pre-osteoarthritis patients and 14 early osteoarthritis patients. Their protocol involved measuring the meniscal position whilst standing and supine in order to calculate the medial displacement index (MDI). In patients in the 'pre-arthritis' group, the MDI increased by around 7% over the course of the study. This increase in MDI was significantly greater in those patients who had progression of osteoarthritis with a displacement rate of around double that in the stable group. Ultrasonic examination is non-invasive and very simple. Although perhaps the application in clinical practice may be somewhat 'small print', we can certainly see an application for this technique in research.

'Home-made' cement has better elution x-ref

■ There is a volume of excellent research surrounding cement spacers and antibiotic elution from the research group in **Sheffield (UK)**.⁷ In their latest addition to what is known about antibiotic spacers, the authors test the hypothesis that home-made and commercial antibiotic-eluting bone cements will have a similar elution rate. The authors produced 18 cement discs containing either a home-made mix of CopalG+V or home-made CopalR+G with additional vancomycin added. Each cement disc contained a standardised 0.5 g gentamicin and 2 g vancomycin. The discs were then immersed in ammonium acetate, and fluid was sampled at eight standardised time points to establish the concentrations of gentamicin and vancomycin using HPLC mass spectrometry. The authors observed the highest peak concentrations of antibiotic in the home-made cements. The overall elution of antibiotic was around fivefold for vancomycin and double for gentamicin from the home-made preparations. There was more effective antibiotic elution with home-made antibiotic spacers in which gentamicin and vancomycin are added into PMMA. The authors found no advantage to using commercially available vancomycin-impregnated antibiotic cement which is typically more expensive. In the use of temporary spacers, clearly home-made preparations with the ability to add tailored antibiotics and the expectation of higher elution have some significant advantages. However, in definitive

surgery one should be aware that mechanical properties of cements can be eroded with home-made mixes. The failure to mix the crystalline antibiotic as thoroughly through the polymer as would occur in the factory leaves hydrophilic crystalline areas that can easily dissipate into solution relying less on the secondary 'leach' seen over longer time periods. However, it also leaves larger potential points of mechanical weakness.

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