ROUNDUP360

Knee

ACI and mosaicplasty compared

Areas of knee surgery that have garnered a fascinating combination of interest, enthusiasm and doubt over many years have been autologous chondrocyte implantation (ACI) and mosaicplasty. Consequently, a paper from **Stanmore (UK)** on the ten-year results of the techniques makes good reading. ACI and mosaicplasty are methods of treating symptomatic articular cartilage defects in the knee. This study represents the first long-term randomised comparison of the two. The researchers took 100 patients at a minimum follow-up of ten years. The mean age of the patients at the time of surgery was 31.3 years and the mean pre-operative duration of symptoms was 7.2 years. The lesions were large, with the mean size for the ACI group being 440.9 mm^2 and that for the mosaicplasty group being 399.6 mm^2. The number of patients whose repair had failed at ten years was 10 of 58 (17%) in the ACI group and 23 of 42 (55%) in the mosaicplasty group. However, the functional outcome of patients with a surviving graft was significantly better in those who underwent ACI compared with mosaicplasty.[1] There appears to be great interest shown in this paper from right around the world, with some long-awaited results. *360* has received more than a handful of recommendations that the study should appear within our pages.

ACI after microfracture is not so good

Not everyone speaks kindly of ACI, as a paper from **Freiburg (Germany)** shows. Surgeons reported on the use of the technique as a second-line treatment for a failed microfracture. Their hypothesis was that ACI was better as a first-line technique than as a second. With this level III study, they took 28 patients with isolated chondral defects of the knee who had been treated with ACI after an earlier microfracture had failed. Failure was defined as the need for reintervention. These patients were assigned to group A and compared with group B, a matched-pair cohort of patients of identical age, defect size, and defect location in which ACI was used as a first-line treatment. Failure rates in both groups were then assessed. The mean follow-up times were 48.0 months for group A and 41.4 months for group B. Group A had a significantly greater failure rate (7 of 28 patients) when compared with group B (1 of 28 patients). There was also a trend toward better knee score results for patients in group B. However, despite the significantly higher failure rate seen in group A, those patients did not reduce their activity levels as a result.[2] So *360* notes that ACI, good though it may be as a primary procedure, subsequently struggles. When used in the wake of an earlier microfracture it has a significantly higher failure rate and inferior clinical outcome.

Exercise therapy and the degenerate medial meniscal tear

A study has appeared from **Stockholm (Sweden)** that perhaps seeks to challenge the practices of so many of us. The subject is arthroscopic surgery for the degenerate medial meniscal tear. Originating from a physiotherapy department, the aim was to prospectively study a randomised group of 96 middle-aged patients in two treatment categories. Radiological examination was performed before randomisation and after five years. The patients were randomly assigned to either arthroscopic treatment followed by exercise therapy for two months or to the same exercise therapy alone. At the start of the study, and at the follow-ups at 24 and 60 months, the patients answered three questionnaires using either the Knee Injury and Osteoarthritis Outcome score (KOOS), the Lysholm Knee Scoring Scale or the Tegner Activity Scale. Patients also made pain ratings on a Visual Analogue Scale (VAS). Both groups showed highly significant clinical improvements from baseline to the follow-ups at 24 and 60 months on all subscales of the three scores. No group differences were found on any occasion. However, one third of the patients who were treated with exercise therapy alone did not feel better after the treatment but were improved after arthroscopic surgery. Furthermore, only two patients from each group showed slight progression of their osteoarthritis after five years. So it seems as if arthroscopic surgery followed by exercise therapy is not superior to the same exercise therapy alone in the middle-aged patient with a degenerate medial meniscal tear.[3] *360* can but agree with the authors that exercise therapy should be recommended as an initial treatment. However, one third of the patients from the exercise group still had disabling knee symptoms but improved to the same level as the rest of the patients once they, too, had undergone arthroscopic surgery with partial medial meniscectomy. We will not put our arthroscopes away quite yet.

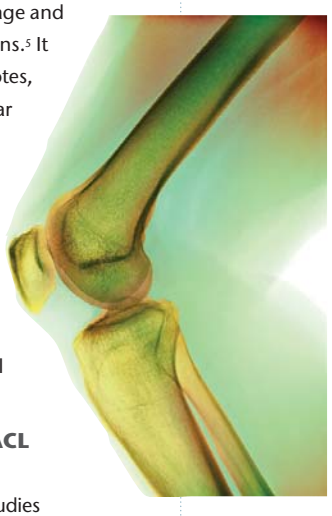
Intra-articular bupivacaine or ropivacaine at knee arthroscopy

With an increasing worry about the adverse effects of certain local anaesthetic agents when in contact with articular cartilage, *360* was pleased to see the study from **Amsterdam (The Netherlands)** into the effectiveness of intra-articular bupivacaine and ropivacaine on pain after knee arthroscopy. This was a double-blinded, randomised clinical trial. It aimed to compare the analgesic effects of low-dose intra-articular bupivacaine and ropivacaine against placebo after knee arthroscopy that had been performed under general anaesthetic. The authors randomised 282 patients into one of three groups - 10 ml normal saline, 10 ml 0.5% bupivacaine or 10 ml 0.75% ropivacaine. Patients received their assigned therapy by intra-articular injection after closure of the portal. Pain and satisfaction were then measured at one hour, four hours and five to seven days after arthroscopy with a Numerical Rating Scale (NRS) score. NSAID consump-

tion was also recorded. The results showed that the one-hour NRS scores at rest were higher in the saline group than with bupivacaine. The one-hour NRS scores in flexion were also higher in the saline group than with either bupivacaine or ropivacaine. NRS satisfaction at four hours was higher for the bupivacaine group compared with the use of saline. However, although these differences were significant, they were also low in magnitude. NSAID consumption was lower in the bupivacaine group than when saline was used. Consequently, although it seems clear that there is improved analgesia after administration of low doses of intra-articular bupivacaine and ropivacaine after arthroscopy of the knee, these differences are relatively small.[4] *360* notes the authors' conclusion that in view of the reports that bupivacaine and ropivacaine might be chondrotoxic and the relatively small improvement in patient comfort found in this trial, perhaps it might be better to use other methods of pain relief instead of intra-articular bupivacaine or ropivacaine after knee arthroscopy. Clearly food for thought.

Lateral trochlear inclination and patellofemoral osteoarthritis

■ Osteoarthritis of the patellofemoral joint (PFJ) can be extraordinarily debilitating and much research time has been spent over the years in establishing predictors for this condition. Trochlear morphology has been thought to be important and the sulcus angle widely used as a measurement of this. So write authors from **Boston (USA)**. However, more recently, lateral trochlear inclination and trochlear angle have been reported as alternatives. The purpose of this Boston study was to determine the association between measures of trochlear morphology and patellofemoral joint cartilage damage and bone marrow lesions. The authors studied 907 knees that formed part of the Multicenter Osteoarthritis Study (MOST), a cohort study of individuals between the ages of 50 and 79 years who either had, or were at risk of, osteoarthritis of the knee. Trochlear morphology was measured using lateral trochlear inclination, trochlear angle, and sulcus angle on axial MRI images; cartilage damage and bone marrow lesions were graded on MRI. The strongest associations were seen with lateral trochlear inclination and lateral PFJ cartilage damage and bone marrow lesions. Knees with a flattened lateral trochlea had more than twice the odds of lateral cartilage damage and bone marrow lesions.[5] It thus seems, *360* notes, that lateral trochlear inclination may be the best method for assessment of trochlear morphology as it has such a strong association with structural damage in the PFJ.



Bone loss and ACL reconstruction

■ Some recent studies have suggested that, after ACL reconstruction, there can be a reduction in bone mineral density around the knee, a decrease that can persist for many years. This decrease might adversely influence graft-to-bone healing as well as the early stability of the knee after reconstruction. Consequently, surgeons from **Hong Kong (China)** have looked into this with a prospective randomised study in 62 adult male patients who were undergoing a primary ACL reconstruction. The patients were randomised into one of three treatment groups - bone-patellar tendon-bone graft, single-bundle hamstring graft or double-bundle hamstring graft. Bone mineral density at the proximal tibia, distal femur, femoral neck and trochanteric region was then measured blindly at one day, three months, five months and one year after surgery. There was significant bone loss from the injured knee and hip at three and five months. This was reversible at the knee but not at the hip at one year after surgery. There was a significant improvement of early clinical and functional outcomes at one year. However, no significant differences in bone loss were seen between the different surgical techniques, although there was a trend towards greater loss of bone density in the single-bundle group five months after reconstruction. There was a significant positive correlation between bone mineral density at the distal femur and the single-leg hop distance at one year.[6] It thus appears that the three surgical techniques are similar in their association with transient bone loss at the knee, irreversible bone loss at the hip, and early clinical and functional outcomes up to one year after ACL reconstruction. Another reason, thinks *360*, to stick to whatever technique makes you most comfortable. In bone density terms there seems little difference between any of them.

Assessing stability using the contralateral knee

■ When examining a patient with a suspected ACL tear, stability is commonly assessed against the contralateral knee. A study from **Cape Town (South Africa)** is thus very helpful in this regard. The authors' objective was to establish the symmetry of rotational knee laxity *in vivo* under passive torsional loading in uninjured subjects. The mean rotation of this control group was then compared with the contralateral, intact knees of ACL-deficient patients. Axial knee rotation was measured in 29 patients with a unilateral ACL injury and 15 uninjured age- and gender-matched controls using an imaging-compatible torsional loading device. Side-to-side differences in internal, external, and range of knee rotation were assessed in the control group. The mean bilateral knee rotation of the controls was then compared with the ACL-deficient patients' uninjured knee data in both full extension and 30° of flexion. Statistically significant differences in symmetry were found in three of the six measures of transverse plane rotation in the uninjured knees; a mean side-to-side difference of 2.2° in range of rotation was detected in the flexed position. No significant differences were observed between the mean values of the healthy control group and the uninjured knees of the ACL-deficient patients.[7] At *360* we think this is fascinating and extremely helpful in the clinic. The authors have shown that bilateral asymmetry of rotational laxity can occur in healthy individuals. Take care when using the contralateral knee as a means of assessing the stability of the injured side. The two knees may not have been equal at the start.

Tranexamic acid – an effective regimen described

■ Wherever *360* looks, tranexamic acid seems to appear, so a study from **Mumbai (India)** into the effects of tranexamic acid during total knee replacement (TKR) is particularly well timed. The authors highlight the fact that the best regimen for this agent has yet to be established so they set about undertaking a level I study to resolve this. They studied different dosages, timings, and modes of administration to identify the most effective regimen of tranexamic acid in achieving the maximum reduction of blood loss at TKR. They prospectively studied five regimens (four intravenous, one local; 40 patients each) with a control group (no tranexamic acid). The four intravenous (10 mg/kg) regimens included (1) an intra-operative dose given before tourniquet deflation, (2) an additional pre-operative dose, (3) an additional post-operative dose, (4) all three doses. The fifth regimen was a single local application. Two independent parameters of drain and total blood losses were also measured. These two parameters

were reduced in all five regimens as compared with the control. However, the clear winner was the three-dose regimen of an injection before, during and after surgery. This resulted in the least drain loss (303 ml) and least total blood loss (688 ml). A single dose did not give effective results at all.[8]

Knee replacement – a useful review

A helpful review of knee replacement surgery has recently appeared from **Oxford (UK)**. The authors point out that knee replacement surgery is frequently performed and highly successful, so they review the epidemiology of, and risk factors for, the operation. Because replacement is increasingly considered for patients younger than 55 years, improved decision making about whether a patient should undergo the procedure is needed. They discuss the assessment of outcomes based on data for revision surgery from registries and on patient-reported outcome measures and conclude that widespread surveillance of existing implants is urgently needed alongside the carefully monitored introduction of new implant designs. Yet this review also brings in some interesting facts. For example, *360* had no idea that TKR is associated with a reduction in continuing healthcare costs of US$278 year on year. This compares with a rise of US$1978 year on year if one waits and watches the OA knee. In contrast, not all patients are happy with the operation. It appears that in Sweden some 8% of patients who had not had a revision were dissatisfied with their TKR between two and 17 years after the primary procedure. When revision was performed, the percentage of dissatisfied customers more than doubled. The authors stress throughout the article that proper patient selection is key. The pioneering days of knee-replacement surgery have probably ended, they say, and future emphasis should first be on improvement of patient selection for surgery. Only those least likely to be harmed by the best-designed implants should be eligible for TKR.[9] *360* certainly agrees.

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