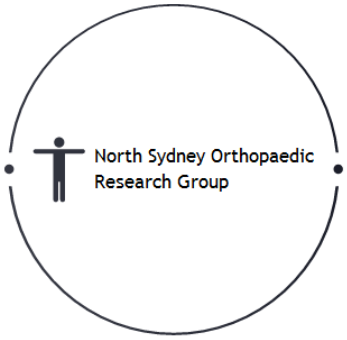
Clinical Research Summaries

North Sydney Orthopaedic Research Group



2015—2021

Professor Leo Pinczewski
Associate Professor Justin Roe
Dr Michael O'Sullivan
Dr Matthew Lyons
Dr Benjamin Gooden
Dr David Carmody
Dr Phil Huang
Dr Lucy Salmon

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An Analysis of Repeat ACL Injury & Return to Sport in 1000 Australian Soccer Players

Justin Roe,
Lucy Salmon,
Faisal Kilani,
Gerardo Zelaya,
Claire Monk,
Keran Sundaraj,
Leo Pinczewski

North Sydney Orthopaedic Research Group

This study was generously supported by The Friends of the Mater

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NORTH SYDNEY ORTHOPAEDIC & SPORTS MEDICINE CENTRE

MATER HOSPITAL SYDNEY
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Introduction:

ACL reconstruction is commonly performed with the goal of returning an athlete to play. Repeat ACL injury after ACL reconstruction is a common and concerning complication. This study determined the extent of psychological readiness, the rate of return to play, and incidence of further ACL injury in a large series of Australian Soccer players after ACL reconstruction.

Methods:

1000 consecutive soccer players who had undergone ACL reconstruction with hamstring tendon autograft between 2007 and 2015 were identified from a prospective database. Subjects were assessed at a minimum of 5 years with questions regarding further ACL injuries, family history of ACL injury, return to sports, the ACL RSI score and Cincinnati Sports Activity Scale.

Results:

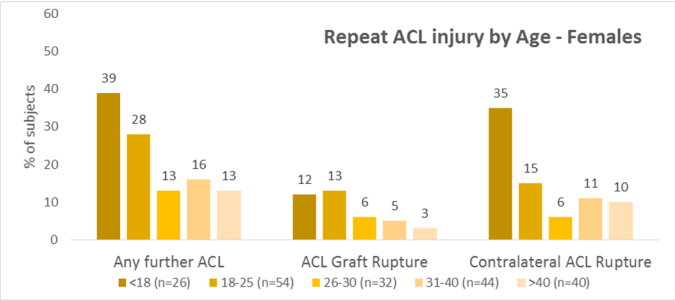
Of the 1000 subjects, 6 revoked consent and 1 died. Of the remaining 993, 861 (87%) were reviewed at a mean 8 years from surgery. There were 665 males (77%), with a mean age of 30 years (range 13-62). A return to soccer was reported by 67%. For those who did not return to soccer the primary reason was knee related in 75%. ACL graft rupture occurred in 100 subjects (11.6%) and contralateral ACL injury occurred in 104 subjects (12.1%).

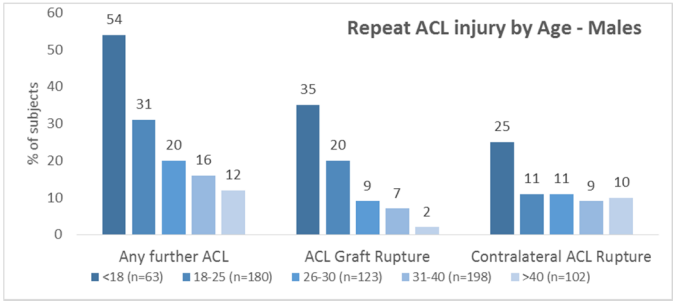
The incidence of repeat injury reduced with advancing age. Young males <18 years were most likely to rupture the ACL graft (35%), and young females were most likely to rupture the contralateral ACL (35%).

Survival of the ACL graft was 92%, 90%, and 87% at 2, 5 and 10 years respectively. Survival of the contralateral ACL was 96%, 90%, 85% at 2, 5 and 10 years respectively. ACL graft ruptures were most frequent in the first 2 years and CACL ruptures were most frequent in years 2-4 after surgery.

On cox regression, predictors of poorer ACL graft survival were age 18 or less (HR 3.6, 95% CI 2.3 to 5.7, p=0.001), males (HR 2.1, 95% CI 1.2 to 3.6, p=0.01), and lateral meniscectomy at the time of reconstruction (HR 1.8, 95% CI 1.1-3.0, p=0.03). The only predictor for worse contralateral ACL survival was age 18 or less (HR 3.4, 95% CI 2.2-5.4, p=0.001).

An ACL-RSI score of <39 was reported by 22%, 39-59 by 19% and 60 or more by 59%. A score of ≤40 on the ACL RSI questions was reported by 27% for likely to reinjure their knee by participating in soccer, 25% for nervous about playing sport, and 32% for fearful of reinjuring by playing sport.





Conclusions:

A high proportion (67%) of Australian soccer players returned to play after ACL reconstruction. Over the first 5 years after reconstruction 1 in 10 injured the reconstructed ACL and 1 in 10 injured the contralateral ACL. Repeat ACL injury was higher in males and youth. Psychological readiness remained low, and fear of reinjury significant for more than 1 in 4 soccer players over the long term.

Opioid Use Before & After Hip and Knee Arthroplasty in an Australian Population

Phil Huang, Jack Brownrigg, Lucy Salmon, Ka Martina, Joanna Crighton, Leo Pinczewski, Benjamin Gooden, Matthew Lyons, Michael O'Sullivan, David Carmody, Justin Roe.

North Sydney Orthopaedic Research Group

This study was generously supported by The Friends of the Mater

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Introduction:

The aim of this study was to determine the rate of opioid use before and after lower limb arthroplasty in an Australian population, and its association with outcome over 6 months.

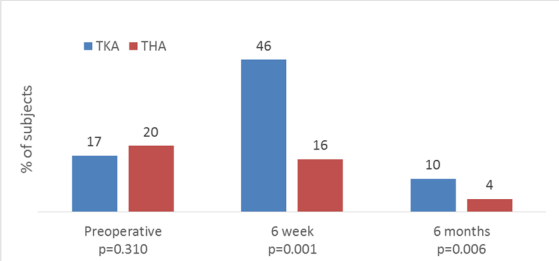
Methods:

837 consecutive subjects who underwent primary elective hip (THA) or knee (TKA) arthroplasty under the care of the 7 investigating surgeons between May 2019 and August 2020 at a Sydney private hospital were prospectively enrolled. Before surgery, all subjects gave informed consent and completed a survey of patient reported outcome measures (PROMS, Oxford Knee or Hip Score, Knee or Hip Osteoarthritis Outcome Score, EQ5D) and questions regarding analgesic and opioid use within the previous 7 days. Subjects returned for clinical review at 6 weeks with monitoring of pain, opioid use and complications. Subjects repeated PROMS and questions regarding opioid use at 6 months after surgery. Daily oral morphine equivalent dosage (OMED) was calculated for each subject at each review.

Results:

837 subjects met the study criteria. Data on opioid consumption was completed by 837 subjects (100%) preoperatively, 792 (95%) at 6 weeks and 709 subjects at 6 months (85%). The proportion of subjects reporting opioid use within the previous week at each review is shown in Figure 1.

Figure 1: Narcotic use in TKA and TKA subjects



Despite similar baseline rates of opioid consumption, after surgery opioid use in TKA subjects was >2.5 times higher than THA subjects at 6 weeks and 6 months after surgery.

Of those taking opioids before surgery 77% had ceased at 6 months after arthroplasty, and only 3% of opioid naïve subjects reported opioid use at 6 months.

Preoperative opioid use was associated with anxiety or depression (OR 2-4x), a lower Oxford Score in TKA (OR 10x), and female subjects in THA subjects (OR 2x).

Opioid use at 6 weeks was associated with preoperative opioid use (OR 3.1), visual analog pain scores more than 5 (OR 5-9x) and attending inpatient rehabilitation (OR 2x).

Opioid use at 6 months was associated with preoperative opioid use (OR 7-11x), and lower 6 month oxford scores (OR 4-9x).

Subjects who took opioids before arthroplasty had lower baseline scores for disease specific, anxiety or depression and general health. However they also experience a greater mean improvement after surgery in these scores to achieve equivalent outcomes to non opioid users at 6 months.

High rates of satisfaction with surgery was reported by both opioid users at 93% and non opioid users at 90% (p=0.488)

Conclusions:

The rates of opioid use before and after arthroplasty surgery observed in this Australian population was considerably lower than those previously reported by international studies. Preoperative opioid use, anxiety, attendance at inpatient rehabilitation, and knee over hip surgery was associated with higher rates of opioid consumption at 6 weeks and 6 months after surgery. Preoperative opioid use was not associated with poorer postoperative outcome scores or lower satisfaction with surgery.

Valgus Coronal Deformity Does Not Adversely Affect Outcomes of Total Knee Arthroplasty

David Carmody,
Ben Gooden, Matt Lyons,
Michael O'Sullivan
Justin Roe,
Leo Pinczewski,
Phil Huang,
Lucy Salmon, Jo Crighton

North Sydney Orthopaedic Research Group

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Introduction:

Coronal deformities are commonly seen in subjects prior to total knee arthroplasty (TKA). While a varus malalignment is more frequent, it is reported that about 10-20% of subjects have a valgus alignment before TKA. A valgus alignment may represent a greater technical challenge for the surgeon. It has recently been reported that a valgus deformity is associated with a two-fold risk of failure at a median follow up of 3.3 years with an incidence of 3.3%, compared to 1.4% in varus aligned TKA in an Italian population[2]. The effect of coronal alignment on patient reported outcomes (PROMS) after arthroplasty has received relatively little attention[1] and its effect on satisfaction with TKA has not been reported.

Methods:

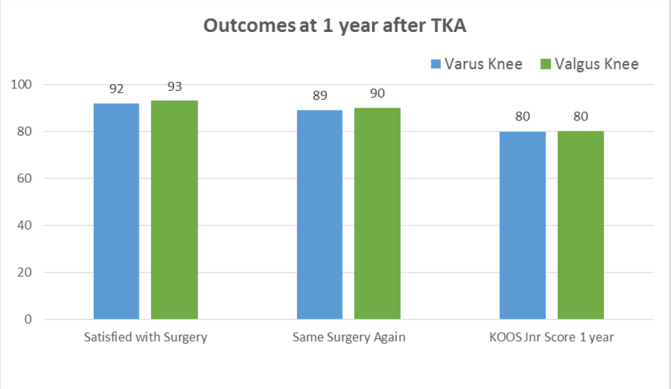
A series of 946 subjects who have undergone total knee arthroplasty between 2015 and 2018 and completed PROMS before and 12 month after TKA formed the study group. Operative data was collected prospectively and included the preoperative coronal alignment. PROMS at 12 months included Oxford Knee Score, KOOS Jnr, and patient satisfaction. Outcomes were compared between varus and valgus knees.

Results:

Before surgery coronal alignment was classified as valgus in 165 knees (17%), and neutral or varus in 781 knees. There were significantly more females in the valgus group, compared to the varus group (76% vs 49%, p=0.001). There was no significant difference in the mean age of the 2 groups (0.138).

At 1 year after TKA 93% of valgus knees and 92% of varus knees reporting that they were satisfied or very satisfied with surgery (p=0.727). The proportion that reported they would undergo the same surgery again under the same circumstances was 90% in the valgus group and 89% in the varus group.

The KOOS Jnr score was 49 in the valgus knees and 48 in the varus knees before surgery (0.209). At 12 months the KOOS Jnr score was 80 in both groups (p=0.874). The mean Oxford Knee Score was 23 in both groups before surgery (p=0.788), and at 12 months was 41 in the Valgus knees and 40 in the varus knees.



Conclusions:

Valgus deformity was not associated with inferior patient reported outcomes or lower rates of satisfaction, compared to varus knees at 1 year after arthroplasty. Valgus deformity is less common than varus deformity before TKA, and predominantly affects females. Further study is warranted to determine how effectively coronal alignment is corrected after TKA, and the influence of the precise magnitude of coronal deformity on outcomes. This study is currently in progress by NSORG in 2021.

References

1. Kahlenberg CA, Trivellas M, Lee Y-Y, Padgett DE. Preoperative Valgus Alignment Does Not Predict Inferior Outcome of Total Knee Arthroplasty. HSS journal : the musculoskeletal journal of Hospital for Special Surgery. 2018;14(1):50-54.
2. Mazzotti A, Perna F, Golinelli D, et al. Preoperative valgus deformity has twice the risk of failure as compared to varus deformity after total knee arthroplasty. Knee Surgery, Sports Traumatology, Arthroscopy. 2019;27(9):3041-3047.

Pain & Function Recovery Trajectory in the first year after Knee Arthroplasty

Justin Roe, Leo Pinczewski,
Matthew Lyons,
Benjamin Gooden,
David Carmody
Lucy Salmon, Ka Martina,
Michael O'Sullivan

North Sydney Orthopaedic Research Group

Introduction:

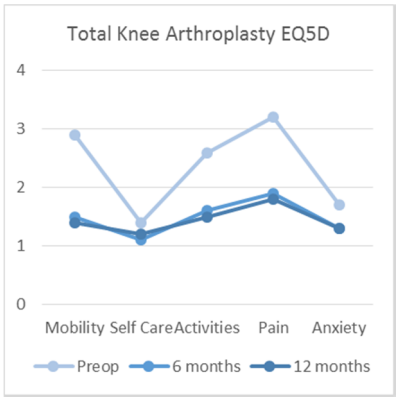
The aim of this study was to assess the pain and function recovery trajectory in the first 12 months after arthroplasty.

Methods:

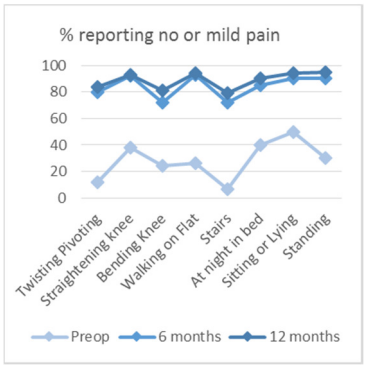
Between July 2015 and June 2018, 980 subjects underwent primary knee arthroplasty (TKA) and completed Patient Reported Outcome Measures (PROMS) before surgery, and consented to participate in our research registry of arthroplasty outcomes. All TKA procedures were performed at the Mater Hospital by one of the 5 investigating surgeons. PROMS included the KOOS knee scores as a disease specific measure and the EQ5D as a general health measure.

Results:

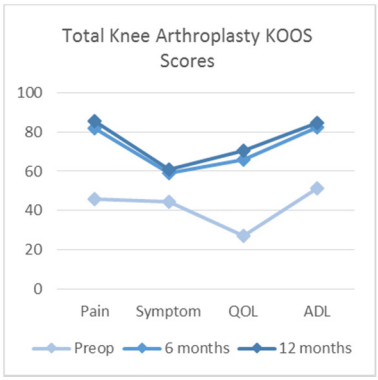
PROMs were completed by 980 subjects preoperatively, 871 subjects at 6 months (89%) and 817 at 12 months (83%).
On self reported health measures (EQ5D) TKA subjects reported significant and clinically meaningful improvements in all domains, especially in mobility, activities and pain over the first 6 months.



The mean KOOS pain score improved from 46 preoperatively, to 82 at 6 months and 86 at 12 months. However only 13% at 6 months and 20% at 12 months reported no pain with any activities, or a KOOS pain score of 100. Pain was most commonly reported with stairs (21%), bending the knee (19%), and twisting activities (16%).



The KOOS Pain score was <90 for 62% at 6 months and 52% at 12 months. Between 6 and 12 months the KOOS scores improved by 4.6% for pain, 3.6% for Symptoms, 6.7% for Quality of Life, and 2.5% for Function



Conclusions:

Over the first year after arthroplasty significant improvements in PROMS are observed. These occur predominantly in the first 6 months, with minimal changes of less than 10% between 6 and 12 months. While the mean pain scores are high at over 86 out of a possible 100 at 12 months, less than 1 in 5 knees report to be completely pain free with all activities

Presented at:

- Australian Knee Society ASM Sydney October 2020

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Unrealistic Expectations of Leisure Activities in Hip and Knee Arthroplasty Subjects

Justin Roe, Leo Pinczewski,
Matthew Lyons,
Benjamin Gooden,
David Carmody, Lucy Salmon,
Ka Martina,
Michael O'Sullivan

North Sydney Orthopaedic Research Group

This study was generously supported by The Friends of the Mater

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Presented at:

- Arthroplasty Society of Australia Annual Meeting 2020

NORTH SYDNEY ORTHOPAEDIC & SPORTS MEDICINE CENTRE

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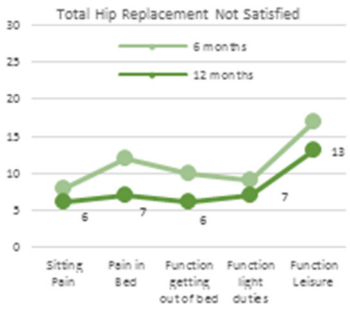
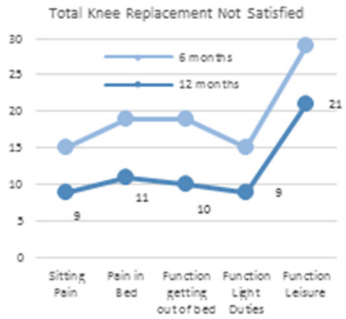
Introduction:

There is a plethora of metrics to assess the outcome and 'success' of hip and knee arthroplasty. Reasonable and realistic expectations for the outcome of hip and knee arthroplasty has become recognized as a potential factor, but has received little attention in analysis of large cohorts to date.

Methods:

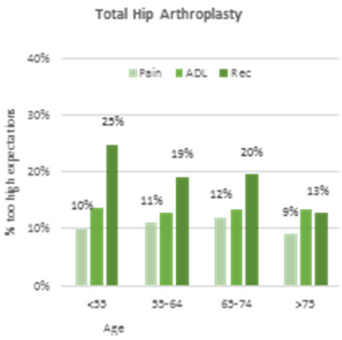
Between July 2015 and June 2018, 2082 subjects underwent primary hip (THA) or knee arthroplasty (TKA) and completed Patient Reported Outcome Measures (PROMS) before surgery. There were 1102 total hip arthroplasty procedures and 980 total knee arthroplasty procedures. PROMS included the HOOS and KOOS knee scores, and Knee Society questions on satisfaction and expectations of surgery.

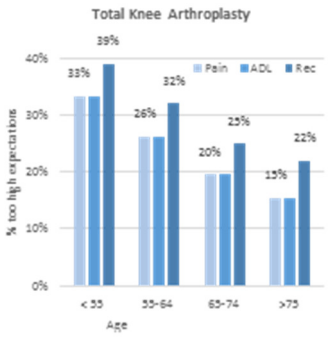




Results:

PROMs were completed by 1828 subjects at 6 months (87.8%) and 1726 at 12 months (82.9%). The proportion of subjects reporting that their expectations were not met was progressively increased with younger age, and was significantly higher in TKA subjects over THA subjects.





Rates of not having expectation met was most common in recreational activities (up to 39%), over pain and activities of daily living. Similarly, 71% of TKA and 83% of THA subjects reported that they were satisfied with their function with leisure activities. Satisfaction rates were higher with pain (85-92%) and light duties (81-90%).

Satisfaction with surgery and not having expectations met were strongly related. Of the subjects who reported their pain relief expectations were too high 41/102 THA subjects (40%) and 79 of 176 (45%) were not satisfied with the outcome of their surgery. Of the subjects who reported their pain relief expectations were met or exceeded 27/855 THA subjects (3%) and 25/667 TKA subjects (4%) were not satisfied with the outcome of their surgery.

Conclusions

Expectations for improvement in ability to perform recreational and leisure activities after arthroplasty surgery may be unrealistic in many hip and knee arthroplasty subjects, especially the younger cohorts.

While only 1 of 10 arthroplasty subjects report they are dissatisfied with the results of their surgery, 1 in 5 THA and 1 in 4 TKA subjects reported their expectations were too high for leisure activities. If pain expectations were met, rates of satisfaction with surgery were impressive 97% for THA and 96% for TKA subjects. Better education to help formulate reasonable and realistic expectations of arthroplasty is indicated, especially in young active subjects.

Total Hip Arthroplasty in Octogenarians. An Age Based Analysis of Complications and Outcomes

Michael O'Sullivan
Lydia Saputra
Ka Martina
Mehnoor Khaliq
Lucy Salmon
Ben Gooden
Matthew Lyons

North Sydney Orthopaedic Research Group

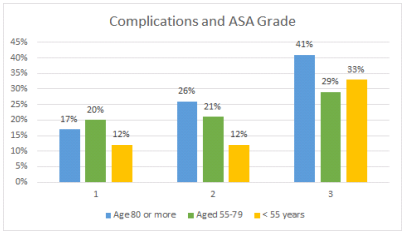
Presented at:

- ISOC Meeting, Lund, Sweden, May 2019
- Arthroplasty Society Annual Scientific Meeting May 2019, Noosa, QLD
- NSW Branch ASM 2019 , Hunter Valley July 2019
- Australian Orthopaedic Association ASM 2019, Canberra, October 2019

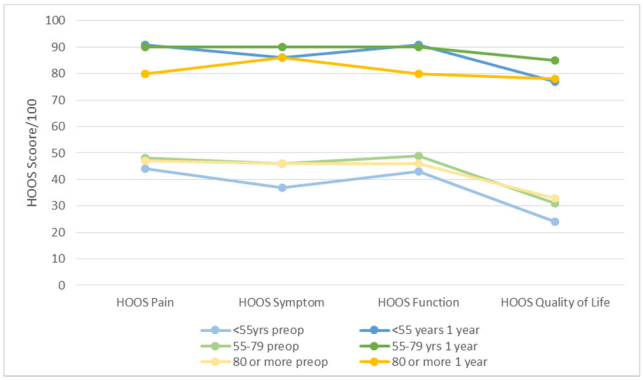
Introduction: The aim of this study was to document the incidence of complications in a population of subjects undergoing elective total hip arthroplasty (THA) across 3 age groups: 80 years or more, 55-79 years and those <55 years.

Methods: 100 consecutive subjects from each of the 3 age groups: 80 or more, 55-79 years and <55 years who had undergone elective THA between September 2015 and June 2018 were identified from a prospective database. Medical records were reviewed to determine the frequency of post operative complications in each cohort. All subjects completed patient reported outcome measures before and 1 year after surgery.

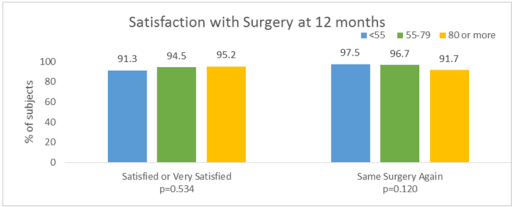
Results: The frequency of complications increased with ASA grade for all age groups (Figure 1). The >80 years group showed a statistically significant higher number of complications at 35%. The most common complications in octogenarians were DVT, cardiac events, electrolyte disturbances and anemia. On regression analysis, ASA grade increased the odds of any complications, and age was not a significant predictor, when controlled for ASA grade (Table 1).



All groups improved mean HOOS scores between preoperative and 1 year after surgery (p<0.001). Before surgery the <55 year group had a significantly lower mean Symptom (p=0.001) and Quality of Life Score (p=0.003). At 1 year after surgery the <55 year experienced a significantly greater improvement in Symptom Score (p=0.005) and Function score (0.002), compared to the 55-79, and 80 or more groups.



There was no significant difference between the three age groups for the level of satisfaction with surgery, or the proportion that would have the same surgery again.



Conclusions: The frequency of complications after THA increases progressively with increasing age. Octogenarians have 1.7 x greater incidence of complication compared to the those 55-79 years. However, ASA grade is a more significant predictor of complications than being an octogenarian. Older age is not associated with lower rates of satisfaction with surgery or poorer pain scores. However, greater improvement in symptom and function score was seen in those <55 years. Being an Octogenarian should not be a deterrent to THA in appropriately selected subjects.

		Any Complications	Odds Ratio	95% CI	P
ASA Grade	**Grade 1-2**	18%	2.8	1.3 to 5.7	0.006
	Grade 3-4	43%			
Age	**80 or more**	34%	1.7	0.9 to 3.2	0.114
	<80 years	17%			

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Anatomical Patella Button Design Improves Outcome of Total Knee Arthroplasty.

Dr Nathanael Ahearn,
Dr Benjamin Gooden
Dr Lucy Salmon
Ka Martina
Dr Matthew Lyons

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Presented

- ISOC Meeting 2019, Lund, Sweden May
- 20th EFORT Congress in Lisbon, Portugal, June 2019
- Arthroplasty Society Annual Scientific Meeting May 2019, Sofitel Noosa, QLD

Background

Patella resurfacing is commonly performed during total knee arthroplasty (TKA), and the patella button design can vary within a TKA implant. Implant design is known to affect patellar kinematics, contact mechanics, and ultimately the outcome of TKA. The aim of this study was to compare the patient reported outcomes of TKA with either an anatomic (AP) or medialized dome (MD) patellar component.

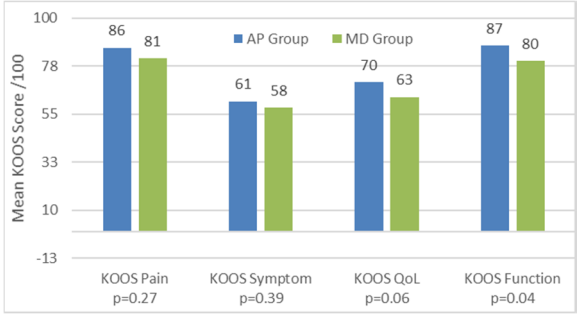
Methods

The study is a prospective cohort study of 100 TKA performed between December 2015 and August 2017. We compared a consecutive series of 50 TKA subjects with an AP, with the previous 50 TKA subjects with a MD patellar. The primary outcome measure was difference in Knee Injury and Osteoarthritis Score (KOOS) at 12 months postoperatively. Other patient reported outcome measures include EQ5D as a general health measure, and patient satisfaction.

Figure 1: Anatomic Patellar Button (left) and Medialised Dome Patellar Button (right)

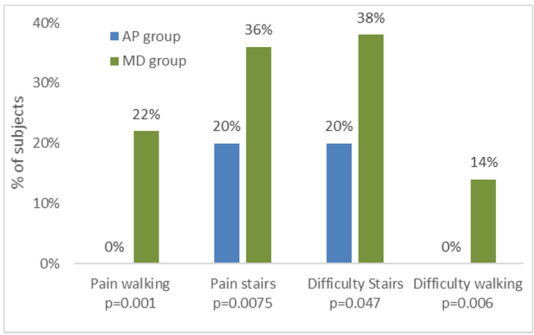
Results

There was no significant difference in baseline characteristics, KOOS, or EQ5D between the two groups.



At 12 months after TKA the AP group had a higher mean KOOS function score (87 versus 80, p=0.04), compared to the MD group.

The AP group also reported greater patient satisfaction (98% versus 82% satisfied, p=0.009) compared to the MD group. Subjects who received the anatomical patellar button had a 9 times lower relative risk of dissatisfaction with surgery, compared to medialised dome subjects.



The AP group had significantly lower frequency of pain with level walking, less difficulty with stairs, and lower mean EQ5D mobility (1.3 v 1.7, p=0.002) at 12 months compared to the MD group.

Conclusions

This study has demonstrated that using an anatomic patella button has significantly superior patient reported outcome measures following TKA, compared with a medialised dome button. The AP Group had a higher mean KOOS Function Score, lower frequency of significant pain and difficulty with level walking and stairs, better mean EQ5D mobility, and superior rates of patient satisfaction at 12 months postoperatively. Use of an anatomic design patellar button, compared to a medialised dome button following TKA improved 12 months outcomes, especially patient satisfaction and a reduction in PFJ adverse symptoms.

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Improvement in sleep patterns after hip and knee arthroplasty: a prospective study in 780 patients

Jan Van Meirhaeghe
Lucy J Salmon
Michael O'Sullivan
Benjamin Gooden
Matthew C Lyons
Leo A Pinczewski
Justin P Roe

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North Sydney Orthopaedic Research Group

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Background

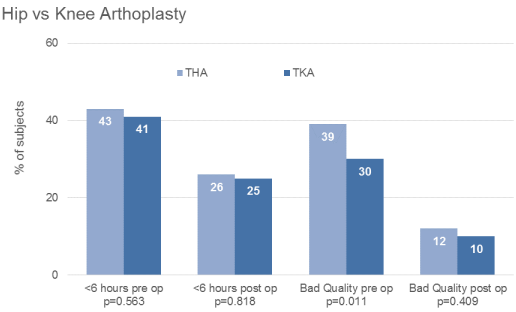
While the relationship between OA and sleep has been examined, relatively few studies have prospectively assessed sleep before and after hip (THA) and knee arthroplasty (TKA). While improvement in sleep quality is consistently reported in these studies, subject numbers are small, ranging from 25 to 105 subjects. Further, there are conflicting reports on the relationship between sleep quality and pain scores, potentially due to inadequate sample sizes. The relationship between sleep and satisfaction with surgery has not been reported previously.

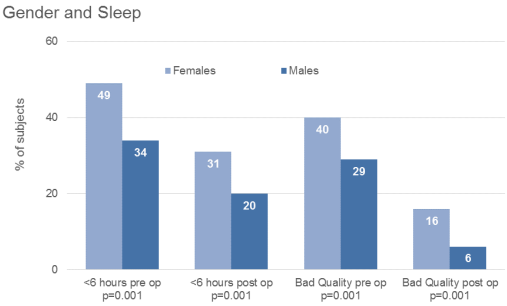
Methods

Between July 2016 and June 2018, surgical data and PROMs were collected on 780 subjects before and 12 months after THA or TKA. PROMs included Knee Injury and Osteoarthritis Outcome Score (KOOS), Hip Disability and Osteoarthritis Outcome Score (HOOS), patient satisfaction and 2 questions from the Pittsburgh Sleep Quality Index (PSQI).

Results

Before surgery, 35% (270/780) reported poor quality sleep. Sleep quality and duration were worse in females over males, and in THA patients (39%) over TKA patients (30%, p=0.011).
Of those reporting bad sleep, 74% (201/270) were improved after arthroplasty. Satisfaction was higher in subjects reporting good sleep quality (626/676, 93%) compared to those reporting bad sleep quality (67/86, 78%) (p=0.001). Sleep was positively correlated with better HOOS/KOOS scores (r=0.2-0.3).





Conclusions

This cohort study found that nearly 1 in 2 report poor sleep quality and sleep duration of less than 6 hours before hip and knee arthroplasty. Poorer measures of sleep were seen in females compared to males, and hip over knee subjects before surgery. At 1 year after arthroplasty, significant improvements in sleep quality and duration were observed. For those with poor sleep quality or duration before surgery, 7 of 10 experienced improvement after arthroplasty. Measures of sleep were positively associated with measures of pain, symptoms, general health, well-being, and satisfaction with surgery. Improvement in sleep may be considered a realistic outcome of hip and knee arthroplasty surgery, with important and meaningful positive effects on health and quality of life.

	Hip Arthroplasty		Knee Arthroplasty		
N	402	*%*	378	*%*	*p*
Sleep Quality					
Improved	157	*39*	121	*32*	*0.146*
Unchanged	22	*55*	233	*61*	
Worse	23	*6*	24	*6*	
Sleep Duration					
Improved	141	*35*	113	*30*	*0.298*
Unchanged	225	*56*	230	*61*	
Worse	36	*9*	35	*9*	

Return to Sport Testing Quantifying Balance, Agility, Speed and Strength is Not Predictive of Return to Sport nor Protective against Second ACL Injury

Claire Monk
Emma Heath
Lucy Salmon
Justin Roe
Leo Pinczewski

This study was generously supported by The Friends of the Mater Foundation

FRIENDS OF THE MATER

Presented at Australian Knee Society Annual Meeting, Canberra 2019

North Sydney Orthopaedic Research Group

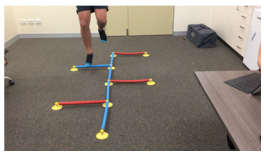
NORTH SYDNEY ORTHOPAEDIC & SPORTS MEDICINE CENTRE

INTRODUCTION:

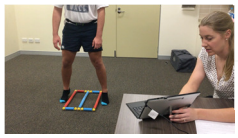
Following anterior cruciate ligament (ACL) reconstruction, ACL graft rupture and contralateral ACL (CACL) injury rates are high, particularly in the young, active population. The return to sport process after ACL reconstruction is difficult and a premature return, in a subject with functional deficits, may contribute to ACL re-injury. The Back in Action system was designed in Austria to evaluate the readiness to return to sport through the quantitative evaluation of the performance of the lower limbs after ACLR in terms of balance, agility, speed and strength (BASS). The aim of this study was to assess if performance on a quantified assessment of BASS is predictive of return to sport (RTS) and second ACL injury in a young, sporting population after ACL reconstruction (ACLR).

METHODS:

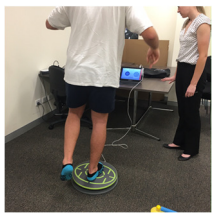
123 subjects aged 25 or less underwent completed the BASS test using inertial sensors, accelerometers and electronic tilt board with the Back in Action Tool (CoRehab, Trento, Italy). The test battery consisted of double and single leg stability



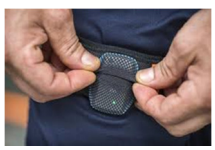
Agility test



Speed test



Balance test using electronic tilt board

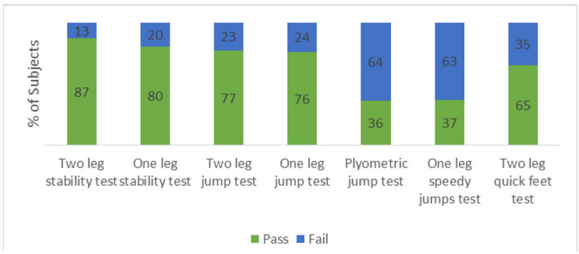


Strength test using accelerometer

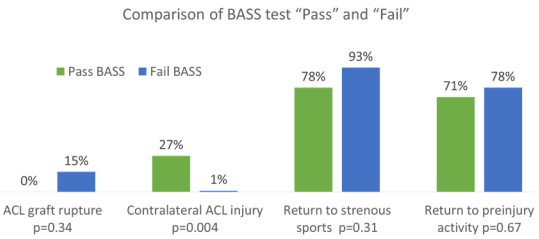
tests, double and single countermovement jump tests, double and single plyometric jump tests, single leg speedy jump test and double leg quick feet test. The IKDC questionnaire was also completed at 6, 12 and 24 months. Return to sport and further injuries to either knee were also assessed at 24 months.

RESULTS: Only 4 subjects (5%) passed all criteria on the BASS test at 6 months, and 11 subjects (11%) at 12 months. There was no significant difference between subjects who passed or failed all components the BASS test in the rate of participation in strenuous sports (p=0.306) or return to pre-injury level of activity (p=0.663) at 24 months after ACLR.

There was no significant difference in the rate of ACL graft rupture between those who passed and failed all components of



the BASS test at 12 months (0% compared to 15%) (p=0.34). However, those who passed the 12 month quick feet test (N=43/52, 83%) were more likely to return to their pre-injury level of activity, compared to those who did not pass (N=15/29, 52%) (p=0.003), and more likely to sustain an ACL graft rupture (N=12/65, 19%) compared to those who failed



(n=1/35, 3%) (p=0.27). Those who passed all components of the BASS criteria at 12 months had a significantly higher rate of contralateral ACL (CACL) rupture compared to those who failed (27% compared to 1%) (p=0.004).

CONCLUSION:

This study is the first to assess performance on the BASS test at 6 and 12 months after ACLR and its utility as a tool for RTS and second ACL injury outcomes. Few subjects who underwent BASS testing at 6 and 12 months after ACLR meet all criteria to pass. Passing all components of the BASS test was not predictive of RTS or ACL graft rupture, but was predictive of sustaining a CACL rupture. Passing the quick feet test was predictive of return to sport and graft rupture. These results do not support the use of this testing battery to clear athletes to return to unrestricted sporting activities after ACLR.

Gluteal Tendinopathy Negatively Impacts Outcomes of Total Hip Arthroplasty

Jack Daoud,
Benjamin Gooden,
Matthew Lyons,
Lucy Salmon
Kaka Martina,
Michael O'Sullivan

North Sydney Orthopaedic Research Group

Accepted for presentation at :

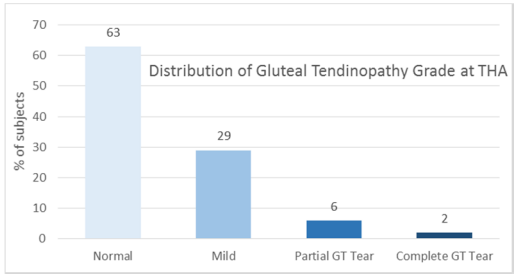
- Arthroplasty Society Annual Scientific Meeting 2019, Noosa, QLD
- ISOC Meeting 2019, Lund, Sweden May 16-18

NORTH SYDNEY ORTHOPAEDIC & SPORTS MEDICINE CENTRE

MATER HOSPITAL SYDNEY
A FACILITY OF ST VINCENT'S HEALTH AUSTRALIA

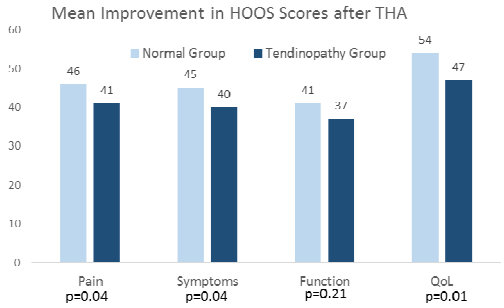
Introduction: A common cause of hip pain is tendinosis or tear of the gluteus medius and minimus tendons of the hip. While it is inferred by many authors that gluteal tendinopathy (GT) may exacerbate the symptoms of hip osteoarthritis (OA), there is no current evidence supporting the notion. The aim of this study was to examine the relationship between GT and patient reported outcomes (PROM) before and after total hip arthroplasty (THA). The hypothesis was that subjects undergoing THA with GT would have worse Hip dysfunction and Osteoarthritis Outcome Score (HOOS), compared to those without GT.

Methods: From a prospective database we identified 310 participants who underwent primary THA for OA over 12 months. At the time of THA surgeons graded the gluteal tendons for tendinosis on a 4 point scale (1 -Normal, 2-mild tendinosis, 3-partial rupture or delamination, or 4-bare greater trochanter). Outcomes were compared between the "Normal" group (Grade 1) and the "GT" group (Grade 2-4).



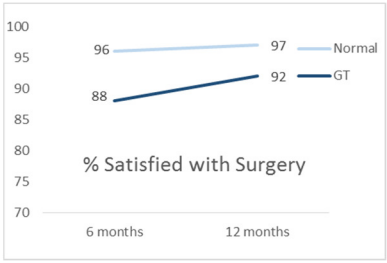
Results: PROMs were completed by 303 subjects before surgery (98%), and 276 subjects at 1 year (89%). GT subjects were older (p=0.001) and more commonly female (p=0.032), than Normal subjects.

There was no significant difference between the Normal and GT groups for mean PROMS before surgery. At 12 months after surgery the GT Group had significantly worse mean HOOS Pain (p=0.01), Symptom (p=0.03) and Function scores (p=0.03), and a trend towards lower Oxford Hip Score (p=0.05) and Quality of Life Scores (p=0.08), compared to the Normal Group. The GT group also had a significantly smaller improvement in HOOS Pain (p=0.04), Symptom (p=0.04), and Quality of Life Score (p=0.02), compared to the Normal group. The magnitude of the effect was small (effect size Cohen's d 0.23 to 0.34). On regression analysis GT was significantly associated with lower HOOS and Oxford Knee Scores, even



when controlled for age and gender.

GT increased the risk of dissatisfaction by 3x at 6 months (p=0.009), and 2.3x at 12 months (p=0.102)



Conclusions: Tendinopathy of the gluteal tendons was commonly observed, occurring in more than 1 in 3 hip arthroplasty subjects. The presence of GT had a significant negative effect on the 12 month patient reported outcomes after THA, however the magnitude of the effect was small. Those with GT had both lower mean 12 month PROM scores, and smaller change in scores after surgery, compared to those without GT. The presence of GT significantly increased the rate of dissatisfaction with surgery at 6 months by a factor of 3x, but the difference at 12 months was not statistically significant.

This study was generously supported by The Friends of the Mater

FRIENDS OF THE MATER

The Utility of Preoperative Blood Screening Before Hip and Knee Arthroplasty

Sarah Shumborski, Benjamin Gooden, Lucy Salmon, Michael O'Sullivan, Leo Pinczewski Justin Roe, Kaka Martina, Sarthak Chopra, Colin Maclean, Matthew Lyons

North Sydney Orthopaedic Research Group

Accepted for presentation at :

- Australian Orthopaedic Association Annual Scientific Meeting, Perth 2018
- Australian Knee Society, Broome 2018
- NSW AOA Branch Meeting, Hunter Valley 2018
- American Academy of Orthopaedic Surgeons Annual Meeting March 2019, Las Vegas, USA

Published ANZ Journal of Surgery, January 2020

NORTH SYDNEY ORTHOPAEDIC & SPORTS MEDICINE CENTRE

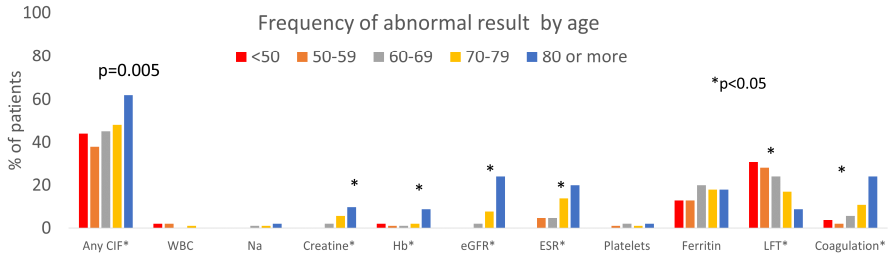
MATER HOSPITAL SYDNEY
A FACILITY OF ST VINCENT'S HEALTH AUSTRALIA

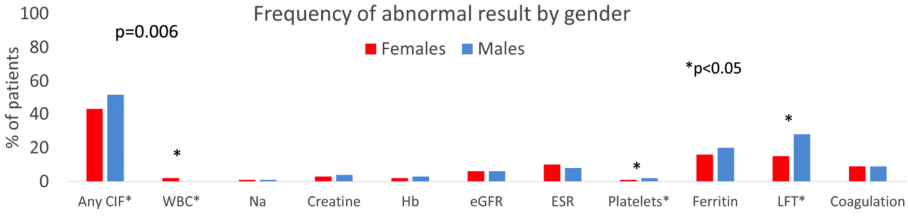
Introduction: It is engrained in medical training that routine blood screening prior to arthroplasty is necessary for optimal patient care. There is little evidence to support their utility and the aggregate cost to the health system. The purpose of this study was to evaluate preoperative blood screening by identifying the frequency of an abnormal result and to examine the influence of age, gender and body mass index (BMI) on the frequency of abnormal blood pathology.

Methods: This is a retrospective review of 1000 patients from a single centre who underwent elective primary hip (THA) or knee arthroplasty (TKA) from 2015-2017. Abnormal blood results were identified and clinically relevant intervals were created for routine markers.

Results: 939 patients had available pathology results with 84% identified as having an abnormal result and 47% having a clinically important range (CIR).

Abnormal Test	% of patients
Any Clinically Important Factor	43
Liver Function Tests	21
Ferritin	18
ESR	9
Coagulation Studies	9
eGFR	6
Cr	4
Haemoglobin	2
Platelets	1
White Cell Count	1
Sodium	1
Albumin	0





Abnormal liver function tests (LFT) and ferritin were most common (Table 1).
With increasing age, there was a significant increase in rates of abnormal CIR, renal dysfunction, abnormal haemoglobin and ESR (Figure 1). Males and patients with BMI > 40 had an increased rate of abnormal results, particularly LFTs (Figure 2).

Conclusions: With rising healthcare costs, responsible clinical practice includes developing strategies to reduce expenses without compromising patient care. The purpose of this study was to identify a possible area in preoperative management in which cost could be reduced for patients undergoing TKA and THA.

Our study determined a high frequency of abnormal results, justifying routine blood screening prior to TKA and THA surgery, particularly for the elderly, males and obese patients

This study was generously supported by The Friends of the Mater

FRIENDS OF THE MATER

5-Year Survival of Pediatric ACL Reconstruction With Living Donor Hamstring Tendon Grafts

Emma L. Heath,
Lucy J. Salmon,
Robert Cooper,
Evangelos Pappas,
Justin P. Roe,
Leo A. Pinczewski

North Sydney Orthopaedic Research Group

Accepted for presentation at :

- Australian Orthopaedic Association Annual Meeting 9-13 October 2016 Cairns
- Sports Medicine Australia Annual Conference, Langkawi, Malaysia, October 2017

Published American Journal of Sports Medicine, Volume 47(1), January 2019

Link to video abstract

NORTH SYDNEY ORTHOPAEDIC & SPORTS MEDICINE CENTRE

MATER HOSPITAL SYDNEY
A FACILITY OF ST VINCENT'S HEALTH AUSTRALIA

Background:

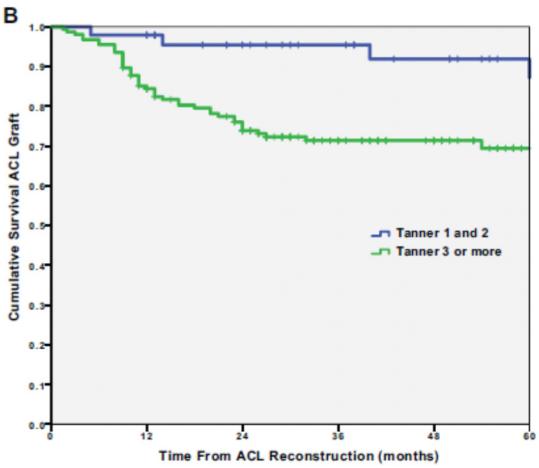
It is well accepted that there is a higher incidence of repeat anterior cruciate ligament (ACL) injuries in the pediatric population after ACL reconstruction (ACLR) with autograft tissue compared with adults. Hamstring autograft harvest may contribute to the risk for repeat ACL injuries in this high functional demand group. A novel method is the use of a living donor hamstring tendon (LDHT) graft from a parent; however, there is currently limited research on the outcomes of this technique, particularly beyond the short term.

The purpose was to determine the medium-term survival of the ACL graft and the contralateral ACL (CACL) after primary ACLR with the use of an LDHT graft from a parent in those aged less than 18 years and to identify factors associated with subsequent ACL injuries.

Methods:

Between 2005 and 2014, 247 (of 265 eligible) consecutive patients in a prospective database, having undergone primary ACLR with the use of an LDHT graft and aged less than 18 years, were included. Outcomes were assessed at a minimum of 2 years after surgery including data on ACL reinjuries, International Knee Documentation Committee (IKDC) scores, and current symptoms, as well as factors associated with the ACL reinjury risk were investigated.

Results: Patients were reviewed at a mean of 4.5 years (range, 24-127 months [10.6 years]) after ACLR with an LDHT graft. Fifty one patients (20.6%) sustained an ACL graft rupture, 28 patients (11.3%) sustained a CACL rupture, and 2 patients sustained both an ACL graft rupture and a CACL rupture (0.8%). Survival of the ACL graft was 89%, 82%, and 76% at 1, 2, and 5 years, respectively. Survival of the CACL was 99%, 94%, and 86% at 1, 2, and 5 years, respectively. Survival of the ACL graft was favorable in patients with Tanner stage 1-2 at the time of surgery versus Tanner stage 3-5 at 5 years (87% vs 69%, respectively; hazard ratio, 3.7; P = .01). The mean IKDC score was 91.7. A return to preinjury levels of activity was reported by 59.1%.



Conclusion:

After ACLR with an LDHT graft from a parent in those aged less than 18 years, a second ACL injury (ACL graft or CACL injury) occurred in 1 in 3 patients. The 5-year survival rate of the ACL graft was 76%, and the 5-year survival rate of the CACL was 86%. High IKDC scores and continued participation in sports were maintained over the medium term. Importantly, there was favorable survival of the ACL graft in patients with Tanner stage 1-2 compared with patients with Tanner stage 3-5 over 5 years. Patients with Tanner stage 1-2 also had a significantly lower incidence of second ACL injuries over 5 years compared with those with Tanner stage 3-5, occurring in 1 in 5 patients. Thus, an LDHT graft from a parent is an appropriate graft for physically immature children.

Survival of ACL Grafts With Univariate Hazard Ratios by Sex[a]

	Male Sex		Female Sex	
	Odds Ratio (95% CI)	*P* Value	Odds Ratio (95% CI)	*P* Value
Positive family history	2.95 (1.3-6.9)	**.01**	0.21 (0.0-11.1)	.23
Tanner stage 3-5	3.53 (1.2-9.9)	**.02**	0.40 (0.0-68.7)	.40
Age ≥14 years	0.47 (0.2-1.9)	.06	1.60 (0.4-7.2)	.54
Open growth plate	0.79 (0.4-1.5)	.49	2.67 (0.4-20.5)	.35

NSOSMC, Mater Clinic, Suite 2, 3 Gillies St Wollstonecraft NSW 2065 AUSTRALIA

Efficacy of The Mater Accelerated Recovery Strategy to Reduce Length of Stay After Arthroplasty

Matthew Lyons,
Michael O'Sullivan,
Leo Pinczewski,
Benjamin Gooden,
Lucy Salmon,
Felicity MacArthur,
Claire Monk, Justin Roe

This study was generously supported by The Friends of the Mater

Introduction:

In a study at The Mater Hospital, comparing subjects discharged home to those attending inpatient rehabilitation after hip or knee arthroplasty, there were no significant differences in patient reported outcomes 6 months after surgery[1]. On the basis of this, the Mater Accelerated Recovery Strategy (MARS) was established. Its aim was

- To reduce acute inpatient length of stay (LOS) from 5-7 days to 3-4 days
- To increase the rate of discharge directly to home over extended inpatient rehabilitation

Methods:

Upon booking arthroplasty, eligibility for the MARS is determined using the Risk Assessment Prediction Tool (RAPT). If deemed suitable, subjects are given a Garmin activity tracker to establish a baseline step count prior to surgery, and to track step count for the first 6 weeks after surgery. For MARS subjects the acute care plan was for 3 attempts at standing and walking on the same say as surgery. MARS subjects were encouraged to dress in "day clothes" and sit out of bed as much as possible. Subjects are discharged directly home 3-4 days after arthroplasty and continue their rehabilitation in the outpatient setting.

Results:

Between February 2018 and September 2018, of the 350 hip and knee arthroplasty subjects, 193 subjects (55%) were deemed eligible for the MARS and 96 (50%) were recruited. 86 subjects (90%) were discharged to home within 3-4 days.

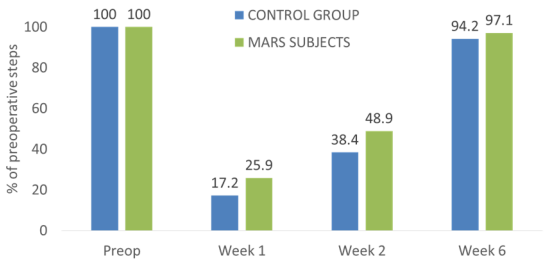
Satisfaction

95% of MARS subjects would participate in an accelerated rehabilitation program again.

At 6 weeks after surgery,

- 95% of subjects were satisfied with the hospital stay
- 94% were satisfied with the rehabilitation experience

Step count



- MARS subjects were taking significantly more steps in week 1 (p=0.001) and 2 (p=0.005) than non MARS subjects

Subjects in the MARS Group took
↑ 50% more steps in week 1
↑27% more steps in week 2
= equivalent at 6 weeks
compared to Control Study Subjects

- MARS subjects were achieving a mean of 50% of their preoperative step count by week 2 and 97% of their preoperative step count by week 6.

Complications

- On an audit of 132 consecutive THR subjects, the incidence of complications was significantly lower in the MARS subjects (6%) compared to the Non MARs subjects (26%), p=0.014.
- The most common complications was hypotension (6-7%) and respiratory tract infection (5% non MARS subjects only)

Conclusions:

The MARS has been successfully implemented at the Mater Hospital in 2018. Prior to the MARS, only 7% of arthroplasty patients of the investigating surgeons elected discharge to home over inpatient rehabilitation. 97% of MARS subjects were discharged to home and did not attend inpatient rehabilitation. The MARS is associated with excellent activity levels and patient satisfaction and a low rate of complications within the first 6 weeks after surgery.

North Sydney Orthopaedic Research Group, The Mater Clinic, Suite 2, 3 Gillies St Wollstonecraft NSW 2065 AUSTRALIA
www.nsorg.com.au Research Contact: Dr Lucy Salmon, lsalmon@nsomsc.com.au

Feedback from Activity Trackers Improve Daily Step Count after Knee and Hip Arthroplasty. A Randomised Controlled Trial.

Matthew Lyons, Benjamin Gooden, Justin Roe, Michael O'Sullivan, Lucy Salmon, Kaka Martina, Claire Monk, Leo A Pinczewski

North Sydney Orthopaedic Research Group

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Accepted for presentation at :

- Arthroplasty Society Noosa, June 2017
- Australian Knee Society, Noosa October 2017
- International Society of Orthopaedic Centres Conference, Sydney, November 2017
- American Academy of Orthopaedic Surgeons Annual Meeting, New Orleans, March 2018
- Australian Orthopaedic Association Annual Meeting, October 2018
- ISAKOS Biannual Congress, Cancun Mexico May 2019

MATER HOSPITAL SYDNEY
A FACILITY OF ST VINCENT'S HEALTH AUSTRALIA

AIM: Commercial wrist worn activity trackers have a great potential to accurately assess activity levels, and are being increasingly adopted in the general population. The aim of this study was to determine if feedback from a commercial activity tracker improved activity levels after total hip (THA) or knee arthroplasty (TKA).

METHODS:

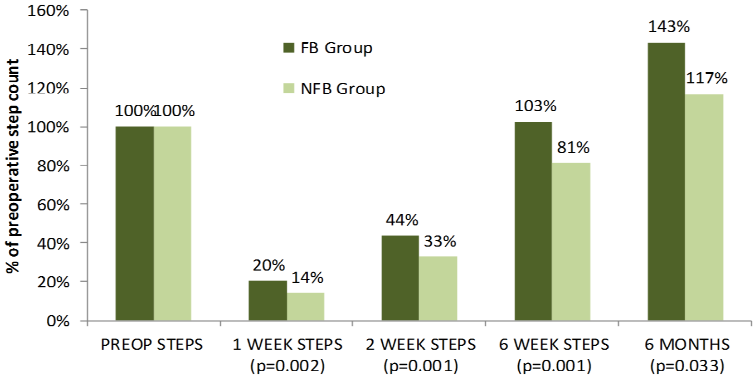
160 consecutive subjects undergoing primary TKA or THA were randomized into 2 groups. Subjects received a Garmin Vivofit® device 2 weeks prior to surgery and completed patient reported outcome measures (PROMS). The step count display was obscured in all subjects in the preoperatively. On day 1 after surgery participants were randomised to either the "Feedback Group" (FB) or the "Non Feedback Group" (NFB). The FB group were able to view their daily step count via the activity monitor or using the app on a mobile device, and were given a daily step goal. Participants in the NFB group wore the device with the display obscured for 2 weeks after surgery, after which time they were also able to see their daily step count, but did not receive a formal step goal. The mean daily steps at 1, 2, 6 weeks, and 6 months were expressed as a percentage of the subject's preoperative steps and compared between the FB and NFB groups. At 6 months after surgery subjects repeated PROMS and daily step count collection.

RESULTS:

Of the 160 joints, 96 underwent THA and 64 underwent TKA. The FB group had a significantly higher mean daily step count by 45% in week 1 (p=0.002), 33% in week 2 (p=0.001), 26% in week 6 (p=0.001) and 23% a 6 months, (p=0.03) compared to the NFB group (Figure 1).

There was no significant difference between the 2 groups for preoperative steps (p=0.0.20), operative type (p=0.79), gender (0.21), mean age (p=0.94), BMI (p=0.51), or preoperative PROMs (p>0.30). There was no significant difference between the groups in patient reported outcomes at 6 months. At 6 months 91% of the FB group and 82% of the NFB group reported they were satisfied with the results of the surgery (p=0.08). At 6 months after surgery 70% of subjects had a mean daily step count of more than 100% of their preoperative level.

Figure 1: Daily Step Count of FB and NFB Group as % of Preoperative Step Count over Time



CONCLUSIONS

Subjects who received feedback from a commercial activity tracker with a daily step goal had significantly higher activity levels after hip and knee arthroplasty over 6 months, compared to subjects who did not receive feedback in a randomised controlled trial. Commercial activity trackers may be a useful and effective adjunct to treatment of subjects after arthroplasty.

Outcome of Juvenile Anterior Cruciate Ligament Reconstruction using Parental Hamstring Allograft

Koushik Ghosh, MSc, MBBS
Lucy Salmon PhD
Emma Heath, MPhty
Leo Pinczewski, MBBS FRACS
Justin P Roe, MBBS FRACS

Accepted for presentation at :

- AANA Specialty Day New Orleans 2014
- APKASS Congress, Nara Japan 2014
- ISAKOS Biennal Conference, Lyon France 2015
- International Olympic Committee, Geneva, Switzerland, 2017
- Combined Orthopaedic Knee Societies Meeting of Australia, Britain, New Zealand and South Africa, October 2017 Noosa, QLD.
- International Society of Orthopaedic Centres, Sydney 2017
- American Academy of Orthopaedic Surgeons Annual Meeting, New Orleans, March 2018

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North Sydney Orthopaedic Research Group

NORTH SYDNEY ORTHOPAEDIC & SPORTS MEDICINE CENTRE

Introduction:

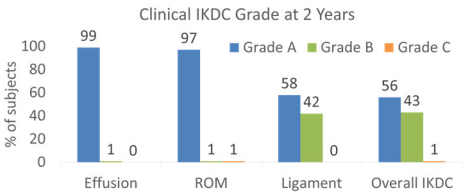
Anterior cruciate ligament (ACL) injuries are occurring with increasing frequency in juveniles, and is associated with higher rates of repeat injury after ACL reconstruction compared to adult cohorts. Over the long term the hazard for ACL graft rupture is 5 x greater in adolescent males and 2.5x greater in adolescent females compared with adults [1].
Use of a parental graft for ACL reconstruction has the theoretical advantages of allowing for a predictable graft diameter, minimizing donor site morbidity for the child, and preserving the neuromuscular structure of the child's knee, all of which may have favorable effect on reducing repeat ACL injury and facilitate a full rehabilitation. Evidence supporting this technique is currently limited.

Methods:

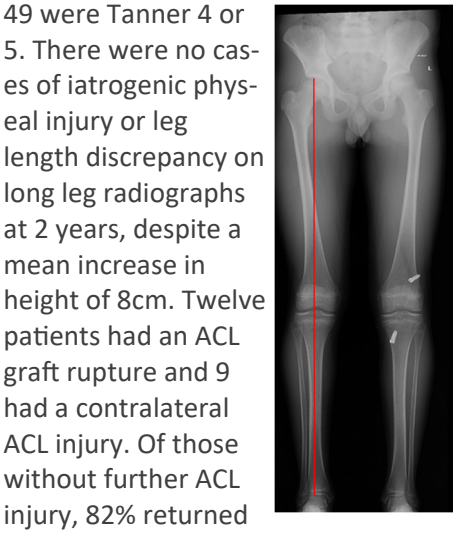
100 consecutive juveniles undergoing ACL reconstruction with a living parental hamstring allograft were recruited prospectively and reviewed 2 years after ACL reconstruction with IKDC Knee Ligament Evaluation, and KT1000 instrumented laxity testing. Skeletally immature participants obtained annual radiographs until skeletal maturity, and long leg alignment radiographs at 2 years. Radiographic Posterior tibial slope (PTS) was recorded.

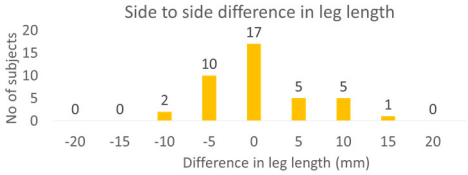
Results:

Of the 100 subjects 96% were followed to 2 years. 69 were male, and the mean age of was 13 years at surgery (range 8-17). The hamstring was donated by father in 79% and mother in 21%. The mean HT graft diameter was 7.5mm (range 6-10mm).



At surgery 30 juveniles were graded Tanner 1 or 2, 21 were Tanner 3 and 49 were Tanner 4 or 5. There were no cases of iatrogenic physeal injury or leg length discrepancy on long leg radiographs at 2 years, despite a mean increase in height of 8cm. Twelve patients had an ACL graft rupture and 9 had a contralateral ACL injury. Of those without further ACL injury, 82% returned to competitive sports, IKDC ligament evaluation was normal in 52% and nearly normal in 48%.





A radiographic PTS of 120 or more was observed in 49%.

Conclusions:

We report a high rate of return to sport in addition to excellent subjective and objective clinical outcomes at two years after ACL reconstruction with living donor hamstring allograft in a juvenile population. Further ACL injury to the reconstructed and the contralateral knee remains a significant risk, with identical prevalence observed between the reconstructed and contralateral ACL after 12 months.

FRIENDS OF THE MATER

This study was generously supported by the Friends of the Mater Foundation

Inpatient Rehabilitation Did Not Affect Patient Reported Outcomes 6 Month After Hip or Knee Arthroplasty.

Benjamin Gooden, Adam Hutchison, Michael O'Sullivan, Mathew Lyons, Justin Roe, Leo Pinczewski, Ka Martina, Claire Monk, Lucy Salmon

North Sydney Orthopaedic Research Group

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- Australian Knee Society, Noosa October 2017
- International Society of Orthopaedic Centres Conference, Sydney, November 2017

MATER HOSPITAL SYDNEY
A FACILITY OF ST VINCENT'S HEALTH AUSTRALIA

AIM:

The use of inpatient rehabilitation after hip and knee arthroplasty varies considerably between Australian States. In NSW inpatient post-operative rehabilitation is used in the vast majority of patients after hip or knee arthroplasty. This study examined patient satisfaction and patient reported outcomes (PROMS) at 6 months after surgery between subjects who attended inpatient rehabilitation and those who did not.

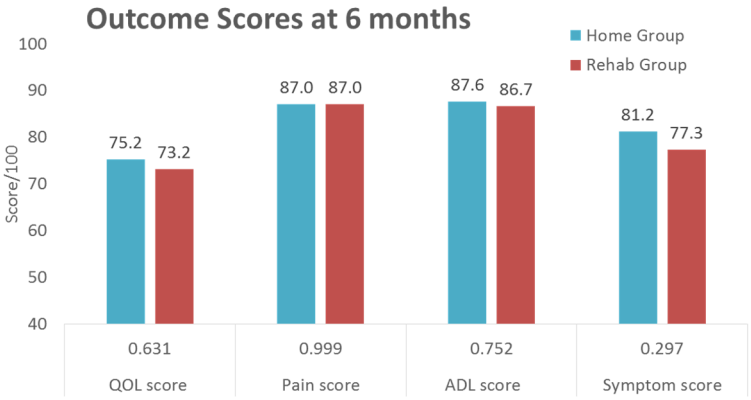
METHODS:

In the 2016 financial year 748 consecutive patients underwent hip or knee arthroplasty at the Mater Private Hospital under the care of the investigating surgeons and were included in a prospective database. Of these, 643 subjects (86%) completed preoperative and 6 month PROMS including Hip or Knee Osteoarthritis Outcome Score, Satisfaction scores and EQ5D. There were 44 patients who were discharged directly to home (Home Group). These subjects were matched for age, gender, procedure and surgeon to 44 patients who attended inpatient rehabilitation (Rehab Group). Six month PROMS scores were compared between those who attended inpatient rehabilitation and those who were discharged to home using SPSS version 24.

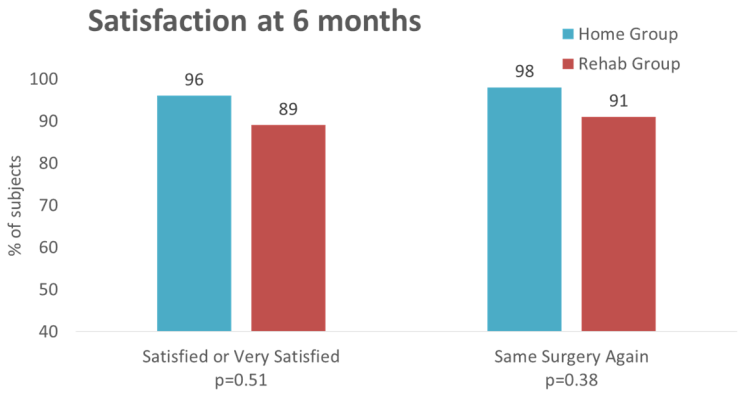
RESULTS:

The mean length of stay in acute care hospital was 5 days in both groups. The median length of stay in inpatient rehabilitation of the Rehab group was 7 days (range 4-16 days).

Six months after surgery there was no significant difference between the Home Group and Rehab Group with respect to Quality of Life Score (p=0.63), Pain Score (p=0.99), ADL score (p=0.75) or Symptom Score (p=0.30) (Figure 1).



At 6 months there was no significant difference between the 2 groups on percentage of subjects satisfied with their surgery (Figure 2)



There was no significant difference between the groups for any other the EQ5D general health measures at 6 months.

CONCLUSIONS

Inpatient rehabilitation after hip or knee arthroplasty did not positively affect patient reported satisfaction, expectation, pain quality of life or ADL scores compared to subjects who were discharged to home at 6 months after surgery in an age, gender and procedure matched analysis.

Bioabsorbable Versus Titanium Screws in ACL Reconstruction Using Hamstring Autograft: A Prospective, Blinded, Randomized Controlled Trial With 13-Year Follow Up.

Keran Sundaraj,
Lucy J Salmon,
Emma L Heath,
Carl S Winalski,
Ceylan Colak,
Amit Vasanji,
Justin P Roe,
Leo A Pinczewski

North Sydney Orthopaedic Research Group

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- ISAKOS Biannual Congress Cancun Mexico May 2019

NORTH SYDNEY ORTHOPAEDIC & SPORTS MEDICINE CENTRE

INTRODUCTION:

Bioabsorbable screws for anterior cruciate ligament reconstruction (ACLR) 7 have been a popular choice with theoretical advantages in future imaging and surgery. The outcome of ACL reconstruction with Titanium and poly-L-lactic acid with hydroxyapatite (PLLA-HA) screws have been compared only with less than a decade follow-up.

In this prospective randomized controlled study of hamstring tendon graft ACL reconstruction, we compare outcomes of a metal interference screw to a screw made of PLLA (70-80%) and hydroxyapatite (20-30%). The outcome of ACL reconstruction comparing a PLLA-HA screw to a titanium screw with MRI and CT scan over 13 years has not previously been reported.

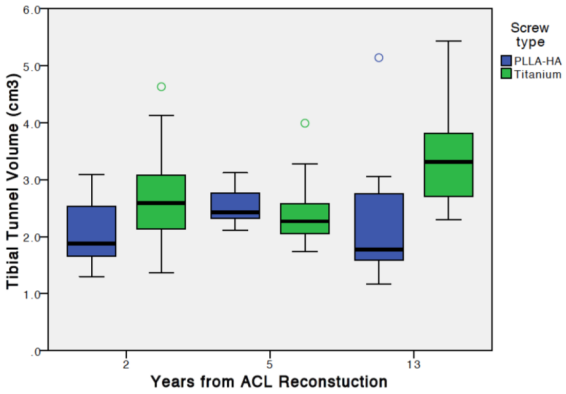
METHODS:

40 patient who met the inclusion and exclusion criteria below were recruited to participate in the trial after giving their signed informed consent.

Patients were randomised to receive either the titanium RCI or HA-PLLA screw for tibial fixation of the ACL graft. Subjects were assessed at 1 week, 6 weeks, 12, 2, 5 and 13 years following surgery with the IKDC Evaluation, KT1000 arthrometer, Lysholm Knee Score, effusion, and kneeling pain. MRI was performed at 2, 5 years and 13 years to evaluate tunnel volumes, peri-screw ossification, graft integration and cyst formation. CT of PLLA-HA patients was performed at 13 years to evaluate tunnel volumes and intra-tunnel 24 ossification.

RESULTS:

There was no difference in clinical outcomes at 2, 5 or 13 years between the two groups. At 13 years, tibial tunnel volumes were smaller for the PLLA-HA group, 2.17cm3, 28 compared with the titanium group, 3.33cm3 (p=0.004). By 13 years, the PLLA-HA group 29 had complete or near complete resorption on MRI or CT.



CONCLUSION:

There were equivalent clinical results between PLLA-HA and titanium groups at 2, 5 and 13 years. While PLLA-HA screws had complete or near complete resorption by 13 years, tunnel volumes remain largely unchanged, with minimal ossification.

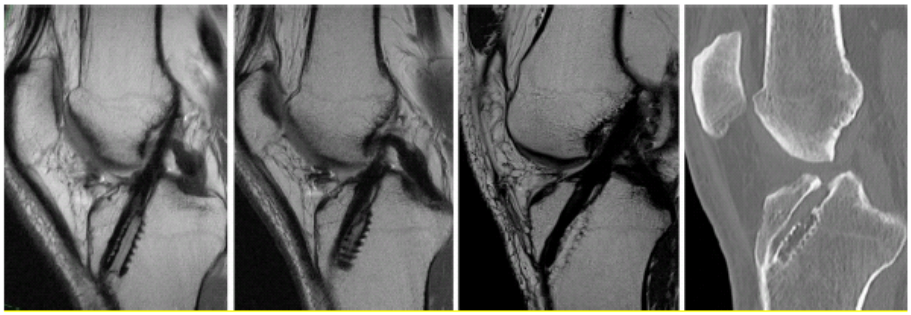


Figure 1. The tibial PLLA-HA screw on the same participant on MRI at (A) 2-years, (B) 5 years (C) 13 years, and CT scan at 13 years. The images shows progressive screw resorption and grade 1 ossification (little or none) at 2 years to complete screw resorption with grade 4 ossification (good) on MRI at 13 years. The CT scan of the same subject demonstrates the 'ghost' outline of the tibial screw which has not ossified.

Patient Reported Outcomes Before & After Arthroplasty. A Comparison of Metropolitan and Regional Subjects.

Mathew Lyons,
Benjamin Gooden,
Michael O'Sullivan,
Ka Martina,
Claire Monk
Lucy Salmon

North Sydney Orthopaedic Research Group

Accepted for presentation at :

- Australian Knee Society, Noosa October 2017
- International Society of Orthopaedic Centres Conference, Sydney, November 2017
- American Academy of Orthopaedic Surgeons Annual Meeting, New Orleans, March 2018

NORTH SYDNEY ORTHOPAEDIC & SPORTS MEDICINE CENTRE

MATER HOSPITAL SYDNEY
A FACILITY OF ST VINCENT'S HEALTH AUSTRALIA

AIM:

To examine the differences in patient reported outcomes after knee and hip arthroplasty between subjects residing in the rural and metropolitan centres.

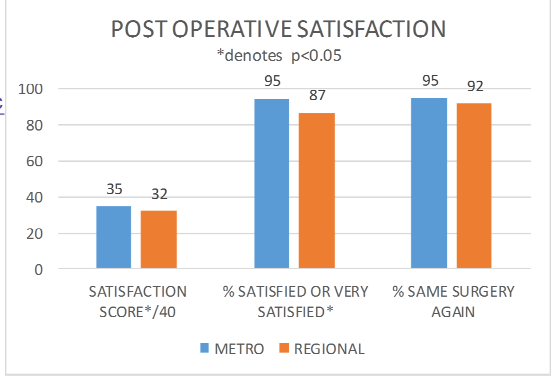
METHODS:

From a prospective database of arthroplasty we identified 867 subjects who underwent hip or knee arthroplasty under the care of the investigating surgeons over 18 months. There were 631 total hip arthroplasty procedures and 236 total knee arthroplasty procedures. Subjects completed patient reported outcome measures (PROMs) preoperatively and at 6 and 12 months after arthroplasty. Subjects were classified into Regional Group or Metropolitan Group based on their primary place of residence.

RESULTS:

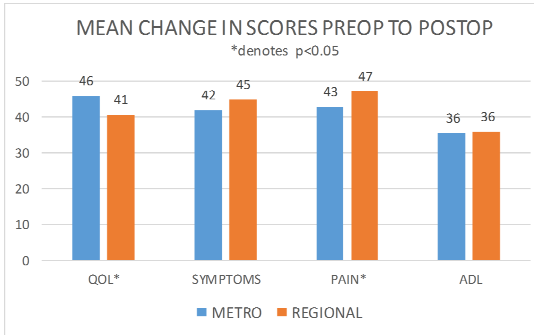
There was no significant difference between the Metro and Regional groups for the variables of mean age (0.45), or gender (p=0.92). At 6 and 12 months after surgery the Metro Group reported significantly higher mean satisfaction score compared to the Regional Group (p=0.001). At 6 months 95% of the Metro Group and 87% of the Regional Group reported they were satisfied with the results of their surgery (p=0.001) (Figure 1).

The Regional Group reported significantly lower preoperative KOOS/HOOS Quality of Life (QOL) (p=0.05), Symptom Scores (p=0.004), Pain Scores (0.001) and ADL Scores (p=0.001) than the Metropolitan Group. After surgery the Regional Group had significantly lower scores on all KOOS/HOOS Subscores. (See Table 1).



	METRO	REGIONAL	P
MEAN QUALITY OF LIFE SCORE			
PREOP	30.1	27.5	0.05
POSTOP	76.4	69.2	0.001
MEAN SYMPTOM SCORE			
PREOP	45.1	40.9	0.004
POSTOP	86.8	83.7	0.024
MEAN PAIN SCORE			
PREOP	47.8	41.3	0.001
POSTOP	90.2	87.9	0.05
MEAN ACTIVTIES OF DAILY LIVING SCORE			
PREOP ADL	49.9	44.4	0.001
POSTOP	87.0	82.3	0.001

The mean change in HOOS/KOOS scores between preoperative and 6 or 12 months was significantly higher for Quality of Life Scores in the Metropolitan Group compared to the Regional Group (p<0.01), see Figure 2.



CONCLUSIONS

Before arthroplasty subjects from regional areas report significantly worse QOL, symptoms, pain and ADL scores than subjects from metropolitan areas. After arthroplasty, regional subjects have poorer mean patient reported outcomes, less improvement in QoL measures, and lower rates of patient satisfaction than metropolitan subjects.

Postoperative microscopy and culture screening following hip and knee arthroplasty - an unnecessary cost with no effect on clinical management?

Mark Kemp, Ka Martina, Claire Collins, Lucy Salmon, Benjamin Gooden, Michael O'Sullivan, Justin Roe, Leo Pinczewski, Matthew Lyons

North Sydney Orthopaedic Research Group

Presented at:

- Australian Orthopaedic Association Annual Meeting , October 2016 Cairns
- American Academy of Orthopaedic Surgeons Annual Meeting March 14 – 18, San Diego, California
- American Academy of Orthopaedic Surgeons Annual Meeting, New Orleans, March 2018

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NORTH SYDNEY ORTHOPAEDIC & SPORTS MEDICINE CENTRE

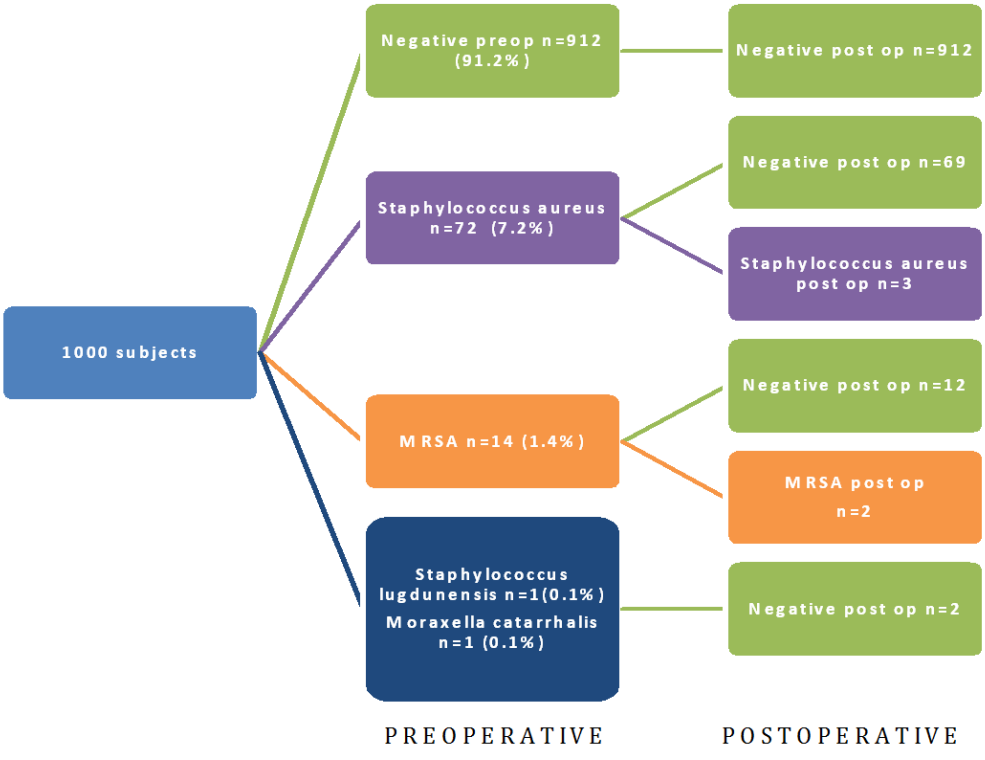
MATER HOSPITAL SYDNEY
A FACILITY OF ST VINCENT'S HEALTH AUSTRALIA

Background

The use of microscopy and culture screening to detect pathogenic micro-organisms followed by a decolonization protocol is a widely performed practice prior to elective hip and knee arthroplasty. In our centre, the routine care of hip and knee arthroplasty also involves postoperative screening including direct culture of the surgical site. The aim of this study was to assess the frequency of pathogen detection following these tests and to determine whether routine postoperative screening, with particular reference to postoperative surgical site culture, led to any change in clinical management of these patients.

Methods

A series of 1000 patients undergoing hip or knee arthroplasty at The Mater Hospital between January 2014 and December 2015 were identified from our arthroplasty database. Results of pre and postoperative microscopy and culture screening were reviewed by two independent researchers.



Results

Of the 1000 subjects, positive microscopy and culture results were identified in 88 patients (8.8%) preoperatively and 5 patients (0.5%) postoperatively. None of the 1000 postoperative surgical site swabs had a positive microscopy and culture screen. All of the 5 positive postoperative microscopy and culture screen results were in patients who had positive cultures preoperatively. There were no positive postoperative microscopy and culture screen results in patients who had had negative preoperative results. Postoperative screening was performed at a cost of AUSti213 per patient.

Conclusion

The results of our study do not support the routine use of postoperative surgical site culture, nor the practice of routine postoperative screening for subjects who return a negative result from preoperative screen. In the presence of a negative preoperative microscopy and culture screen is extremely unlikely to obtain a positive result postoperatively. The practice is therefore performed at an additional and unnecessary cost without any benefit to patient care. As well as this, performance of routine surgical site cultures potentially increase the risk of developing a postoperative infection given that the surgical site wound must be exposed to perform the test. We therefore continue to support the use of preoperative routine microscopy and culture screening to reduce the risk of postoperative surgical site infection but would recommend against the practice of routine postoperative surgical site culture in all patients as well as routine postoperative screening in those patients with negative preoperative tests.

NSOSMC, Mater Clinic, Suite 2, 3 Gillies St Wollstonecraft NSW 2065 AUSTRALIA
The Mater Hospital , Rocklands Rd Wollstonecraft NSW 2065 AUSTRALIA

Objective Measure of Activity Level After Total Knee Arthroplasty with the Use of the 'Fitbit' Device. Preliminary Results

Justin Roe FRACS

Lucy Salmon PhD

Benjamin Gooden FRACS

Joshua Twiggs

North Sydney Orthopaedic Research Group

Presented:

- Australian Knee Society ASM, 15-18 October 2015, Byron Bay, Australia
- AOA and NZOA Annual Scientific Meeting 2016, Cairns
- ISOC Meeting London 2016

NORTH SYDNEY ORTHOPAEDIC & SPORTS MEDICINE CENTRE

MATER HOSPITAL SYDNEY
A FACILITY OF ST VINCENT'S HEALTH AUSTRALIA

INTRODUCTION

Mobility and physical activity are imperative to healthy aging. Measurable improvements in activity level have been reported after total knee arthroplasty (TKA) [4, 5]. However historically, activity level after TKA has been assessed with subjective questionnaires from patients[4]. The recent development and commercial release of non invasive, light weight, low cost accelerometers has great potential to more accurately assess activity level before and after knee arthroplasty from a small light weight wrist strap. These devices have been shown to be valid and reliable assessment tools for activity levels in normal subjects[1]. After cardiac surgery, authors have demonstrated a relationship between activity level assessed with the FitBit device and length of stay[3].

AIM:

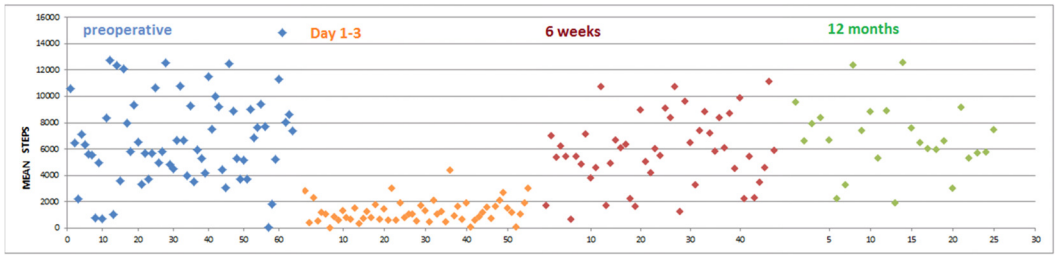
The aim of this study was to assess the efficacy of using a modern commercially available accelerometer known as a "FitBit" to assess activity level before and after TKA.

METHODS

In this study the Fitbit device was worn by TKA patients for 5-7 days at 4 times periods: before surgery, day 1-5, 6 weeks and 12 month after arthroplasty. Subjective outcomes including preoperative and 12 month Knee injury and Osteoarthritis Outcome Score (KOOS), WOMAC Assessment and Patient Satisfaction Scale were collected.

RESULTS:

54 patients (63 knees) participated over 12 months. There were 26 males and 28 females with a mean age of 70 years. The mean number of steps per day was 6596 preoperatively, 1168 in Day 1-3 post op, 5707 at 6 weeks and 7228 at 1 year after TKA. Preoperative activity level was significantly correlated with preoperative Pain Score (p=0.003), activity level in the first 3 days (p=0.01), and at 6 weeks (p=0.001). Short battery life and technical failure of the 'fitbit' device hampered successful data extraction in approximately 20% of this series



CONCLUSIONS

Modern accelerometers present a novel way to objectively measure activity level before and after TKA.

One year after TKA on average subjects are taking 7200 steps per day. Only 50% of participants were taking >7000 steps per day at 1 year, which is the activity level recommended for 65+ years, and is well below the recommended daily average of 10,000 steps per day for healthy adults

Although KOOS scores significantly improved between preop and 12 months after TKA, this does not translate to an increase in activity level at 12 months

Continued follow up is in progress. Further studies are planned to see if activity levels after TKA can be improved by using these devices when patients are provided feedback and goals on daily activity.

Results of the Mater Orthopaedic Outcomes Registry (MOOR).

A/Prof Justin P Roe
A/Prof Leo A Pinczewski
Dr Matthew Lyons
Dr Michael O'Sullivan
Dr Benjamin Gooden
Ka Martina
Dr Lucy J Salmon

Presented:

- Australian Knee Society ASM, 15-18 October 2015, Byron Bay, Australia
- AOA and NZOA Annual Scientific Meeting, Cairns 2016

North Sydney Orthopaedic Research Group

NORTH SYDNEY ORTHOPAEDIC & SPORTS MEDICINE CENTRE

MATER HOSPITAL SYDNEY
A FACILITY OF ST VINCENT'S HEALTH AUSTRALIA

INTRODUCTION:

The Mater Hospital is acknowledged as the largest joint replacement centre in the Southern Hemisphere with over 2000 joint replacements performed annually. The systematic monitoring of the outcomes of joint arthroplasty performed at The Mater hospital is integral to quality assurance to ensure that patients are receiving the best and most current standard of care.

The aim of this study was to trial a pilot prospective data registry to document hip and knee arthroplasty procedures performed at the Mater Hospital, including operative variables, as well as patient reported outcome measures (PROMS) after surgery. This is a collaborative project between The Mater Hospital and North Sydney Orthopaedic Research Group (NSORG).

METHODS:

All patients undergoing hip or knee joint arthroplasty under the care of the 5 participating pilot study surgeons were invited to participate in the prospective registry. Informed signed consent was obtained from all participants. Operative variables were prospectively collected at the time of surgery.
Prior to surgery and at 6 and 12 months after surgery participants completed subjective questionnaires including Oxford Scores, Hip or Knee Orthopaedic Outcome Scores (HOOS and KOOS), EQ5D, Patient Satisfaction and Expectation Scores.

RESULTS:

Between July 2015 and December 2018, 2769 participants were included in the prospective registry, including 1259 and 1510 total knee and hip arthroplasties respectively. 2582 subject were consented. PROMS were completed by 97% of subjects preoperatively. Currently, 1958 and 1577 subjects have completed postoperatively at 6 months and 12 months after surgery postoperatively, with the follow-up still in progress.

The mean BMI of hip arthroplasty subjects was 28 and knee arthroplasty subjects was 29.6. Mean patient reported outcome scores of hip and knee arthroplasty participants significantly improved preoperative to postoperatively as shown in ***Table 1***. 95% of hip and 89% of knee subjects reported they would undergo the same procedure again under the same circumstances at 6 and 12 month review.

CONCLUSIONS:

Routine collection of operative variables and patient reported outcomes before and after arthroplasty was successfully implemented in this study. Hip and knee arthroplasty is associated with excellent patient reported outcomes and satisfaction at 6 and 12 months after surgery. Furthermore, the routine collection of this data has led to the successful execution of numerous research publications and presentations at international forums by the NSORG group. (see full NSORG portfolio)

Table 1. Patient Reported Outcomes Scores		Preop	6 months	12 months
HIP ARTHROPLASTY	Oxford Hip Score/48	23	42	43
	HOOS Pain Score/100	47	89	91
	HOOS ADL Score/100	49	87	90
	Same Surgery Again		95%	95%
KNEE ARTHROPLASTY	KOOS Pain Score/100	44	59	61
	KOOS ADL Score/100	51	83	85
	Same Surgery Again		89%	89%

20 Yr Outcomes of ACL Reconstruction with Hamstring Tendon Autograft. The Catastrophic Effect of Age & Posterior Tibial Slope.

A/Prof Leo A Pinczewski
Dr Lucy J Salmon
Emma Heath
Dr James Linklater
A/Prof Justin P Roe

Presented:

- Australian Orthopaedic Association Annual Meeting , October 2016 Cairns
- Curso Avanzado de Cirugía Rodilla, Santiago February 2017
- American Academy of Orthopaedic Surgeons Annual Meeting March 2017 San Diego, California
- Australian Knee Society Noosa October 2017
- ASICS Sports Medicine Australia Conference, Langkawi , Malaysia, November 2017

Published:
American Journal of Sports Medicine (in press)

NORTH SYDNEY ORTHOPAEDIC & SPORTS MEDICINE CENTRE

MATER HOSPITAL SYDNEY
A FACILITY OF ST VINCENT'S HEALTH AUSTRALIA

INTRODUCTION:

The aim of this study was to compare the prospective longitudinal outcome of 'isolated' ACL ruptures treated with anatomical endoscopic ACL reconstruction using hamstring tendon autograft over 20 years in adolescent and adult cohorts, and the examine factors for repeat ACL injury.

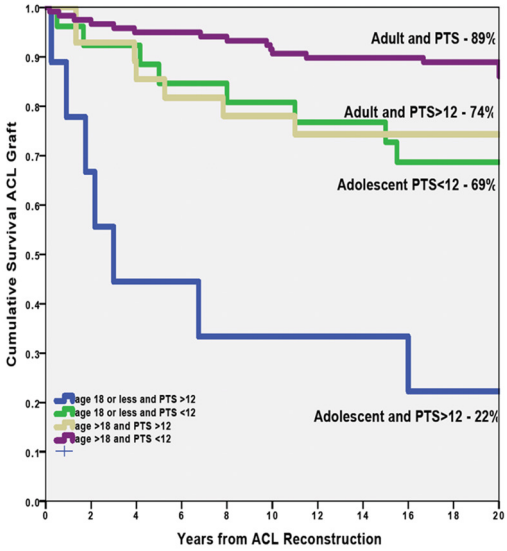
METHODS:

A single surgeon series of 200 consecutive patients undergoing isolated primary ACL reconstruction with hamstring tendon autograft were prospectively studied. Subjects were assessed preoperatively and 2, 7, 15 and 20 years post-operatively. Outcomes included: IKDC Knee Evaluation, IKDC subjective scores, KT1000 Instrumented laxity testing and radiological evaluation of degenerative change and medial tibial slope. 20 year outcomes were compared between those who underwent surgery at the age of 18 years or less (adolescent group n=39) and those who underwent surgery >18 years (adult group n=161).

RESULTS:

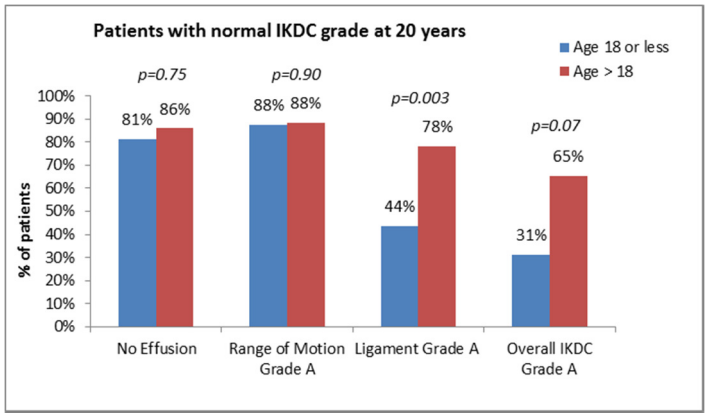
At 20 years 179 of 200 subjects were reviewed (89.5%). Outcomes were not statistically different between adolescents and adults for the variables of IKDC subjective score (p=0.29), return to preinjury activity level (p=0.84), current activity level (p=0.69) or degree of radiological degenerative change at 20 years (p=0.51). The adolescent group had a higher proportion with grade 1 laxity testing compared to the adult group (p=0.003).

Overall ACL graft survival at 20 years was 86% for adults and 61% for adolescents (HR 3.3; p=0.001). The hazard for ACL graft rupture was increased by 4.8 in adolescent males and 2.5 in adolescent females, compared to adults. At 20 years the ACL survival for adolescents with a PTS of >120 was 22%. The hazard for ACL graft rupture was increased by 11 in adolescents with a PTS of >120 (p=0.001), compared to adults with a PTS <120.



CONCLUSIONS:

Isolated ACL reconstruction using this technique was associated with good long term outcomes with respect to patient reported outcomes and return to sports, regardless of age. However, mild ligament laxity and ACL graft rupture after ACL reconstruction is significantly more common in the adolescents, especially adolescent males, compared to adults. PTS of 12 degrees or more is the strongest predictor of repeat ACL injury, and its negative effect is most pronounced in adolescents.



Total knee replacement with an Oxidised Zirconium femoral component: ten year survivorship analysis

Issaq Ahmed,
Lucy J Salmon
Hiroki Watanabe
Justin P Roe
Leo A Pinczewski

Presented:

- Australian Knee Society ASM, 15-18 October 2015, Byron Bay, Australia

Published:
Bone and Joint Journal 98-B (1) 58-64; January 2016

INTRODUCTION:

Total knee replacement (TKR) is a highly effective procedure in producing good functional outcomes and long term survival rates of greater than 90%. Despite these excellent results polyethylene wear leading to osteolysis remains a common cause of failure. In an attempt to reduce wear and improve long term survival rates there has been considerable interest in the use of alternative bearing surfaces to improve the wear characteristics of the femoral component. Oxidized zirconium has been shown in numerous in vitro and retrieval studies to have better wear properties than cobalt chromium and cause less surface damage on the polyethylene component.

We performed a retrospective review of a prospectively collected database to assess the ten year survival and clinical and radiological outcomes of the oxidized zirconium TKR with the Genesis II prosthesis. We hypothesised that the use of this implant would produce comparable clinical outcomes and survivorship to those reported at mid term follow up.

METHODS:

We performed a retrospective review of a prospectively collected database to assess the ten year survival and clinical and radiological outcomes of the oxidised zirconium total knee replacement (TKR) with the Genesis II prosthesis. Outcome measures included the Western Ontario and McMaster Universities Osteoarthritis Index, Knee Injury and Osteoarthritis Outcome Score (KOOS) and a patient satisfaction scale.

RESULTS:

A total of 303 consecutive TKRs were performed in 278 patients with a mean age of 68 years (range 45 to 89 years). The ten year survival rate from the Kaplan–Meier predicted survivorship was 97% (95% CI 94 - 99) with revision for any reason as the endpoint. There were no revisions for loosening, osteolysis or implant failure. There was a significant improvement in all components of the WOMAC score at final follow up ($p<0.001$).

CONCLUSIONS:

Our study supports the hypothesis that over the long term TKR with an oxidised zirconium femoral component gives comparable survival rates and functional outcomes to conventional implants as reported from several national joint registries. However whether this implant leads to fewer revisions for polyethylene wear and osteolysis compared to a conventional CoCr implant to justify its selective use in younger patients and its increased costs is yet to be determined.

Table 1. Functional outcomes scores and range of movement

Parameter	Pre operative (n=303)	10 years postop (n=216)	p
Mean WOMAC score			
Pain	49 (5-95)	90 (5-100)	0.001
Stiffness	44 (0-100)	83 (25-100)	0.001
Function	47 (7-88)	85 (15-100)	0.001
Total	48 (13-84)	85.7 (15-100)	0.001
Mean KOOS scores			
Symptoms	n/a	82.4 (36-100)	n/a
Pain	n/a	87.5 (6-100)	n/a
ADLS	n/a	84.9 (15-100)	n/a
Quality of life	n/a	71.4 (6-100)	n/a
Mean Range of flexion (range)	116 (70 to 140)	114 (70 to 130)	0.012

Osteoarthritis, Outcomes and Reinjury 20 years After ACL Reconstruction with Hamstring or Patellar Tendon Grafts

Simon Thompson,
Lucy Salmon,
Alison Waller,
James Linklater,
Justin Roe
Leo Pinczewski

North Sydney Orthopaedic Research Group

Presented at:

- Australian Orthopaedic Association Annual Meeting, 11-15 October 2015, Brisbane
- Australian Knee Society ASM, 15-18 October 2015, The Byron at Byron
- * APKASS Congress, June 9 -12, 2016, Hong Kong – Macau
- * ISAKOS Biennial Congress, May 2017 Shanghai

Published
American Journal of Sports Medicine
Volume 44 (12) 2016

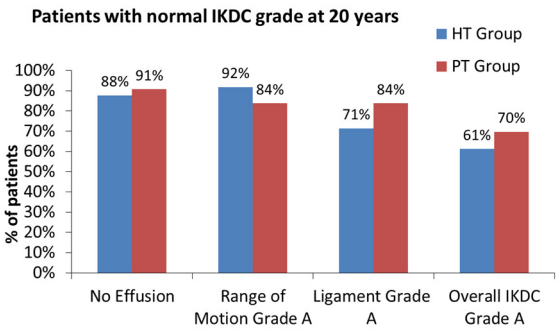
Objective:
This prospective longitudinal study compares the results of ACL reconstruction using 4-strand hamstring tendon (HT) and patellar tendon (PT) autograft over a 20-year period

Method:
90 consecutive patients with isolated ACL rupture were reconstructed with a PT autograft and 90 patients received HT autograft, with an identical surgical technique. Patients were assessed at 2, 5, 7, 10, 15 and 20 years. Assessment included the IKDC Knee Ligament Evaluation including radiographic evaluation, KT1000, Lysholm Knee Score, kneeling pain, and clinical outcomes.

Results:
Subjects who received the PT graft had significantly worse outcomes compared to those who received the HT graft at 20 years for the variables osteoarthritis visible on xrays (61% v 41%, p=0.01), kneeling pain (38% v 20%, p=0.02), and incidence of ACL injury to the opposite knee (29% v 17%, p=0.04). There was no significant difference between the HT and PT groups in overall IKDC grade (p=0.23), or IKDC subjective score (p=0.18). At 20 years 53% and 57% pf the PT and HT groups participated in strenuous or very strenuous activity (p=0.55).

Differences in outcome between males and females were identified. The female PT group reported significantly lower mean IKDC subjective scores (p=0.05), more pain (p=0.02) and swelling (0.03) with activity, and more difficulty with kneeling (p=0.04) compared to the other subgroups at 20 years.

ACL graft rupture occurred in 18% of HT group and 10% of the PT group (p=0.13). The significant predictors of ACL graft rupture was are shown in Table 1. Graft type was not a predictor of ACL graft rupture (p=0.11). Contralateral ACL injury was associated with age less than 18 years (HR=3.4, p=0.001), and the patellar tendon graft (HR=2.2, p=0.02).



Conclusion:
Over 20 years, endoscopic ACL reconstruction using either an autologous HT or PT graft with is associated with excellent subjective outcomes and clinical ligamentous stability that are maintained, with high rates of continued participation in active sports. Regardless of graft type, ACL-reconstructed patients have a high incidence of further ACL injury (30%). Graft rupture is strongly associated with younger age, nonideal graft position, and male sex. Injury to the contralateral ACL is associated with younger age and PT graft choice. Patients who receive an HT graft have a lower incidence of kneeling difficulty and radiological OA than their PT-reconstructed counterparts. Given that the operative procedure and tunnel placement of the 2 graft choices are similar, any differences in outcome are attributable to graft choice. Although both the HT and PT grafts can be considered viable choices, the long-term results in this series favor the HT tendon graft, over the PT graft, for the lower incidence of radiological OA.

Table 1: Predictors of ACL Graft Reinjury

Factor & Category	% with intact ACL graft	Hazard Ratio	95% CI*	p
Age at surgery				
< 18 years	67	4.6	1.7-2.7	0.003
>18 Years	88			
Gender				
Male	78	3.9	1.5-10.6	0.007
Female	89			
Tunnel Placement				
Non ideal	82	3.6	1.2-10.3	0.02
Ideal	93			

*confidence interval

Two-Stage Revision ACL Reconstruction: Supercritical Sterilized Bone Allograft is Effective in the Treatment of Tunnel Defects.

Gerrit J Van de Pol, MD, FRACS
Sjoerd Ruen, MD, PhD
Lucy J Salmon, PhD
Fiona Bonar, MBBCh, FRCPA
Justin P Roe, MBBS, FRACS
Leo A Pinczewski, MBBS, FRACS

North Sydney Orthopaedic Research Group

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NORTH SYDNEY ORTHOPAEDIC & SPORTS MEDICINE CENTRE

INTRODUCTION

The aim of this study was to examine the histological properties of the grafted bone tunnels at the time of second stage revision ACL reconstruction to assess the in-vivo appearance of supercritical carbon dioxide sterilized bone allograft and to quantify the amount of graft incorporation. Additionally, we intended to compare the histological incorporation to its radiological appearance and correlate the incorporation to the clinical outcome of the revision procedure. This is the first study describing the use of supercritical sterilized bone allograft in humans.

METHODS:

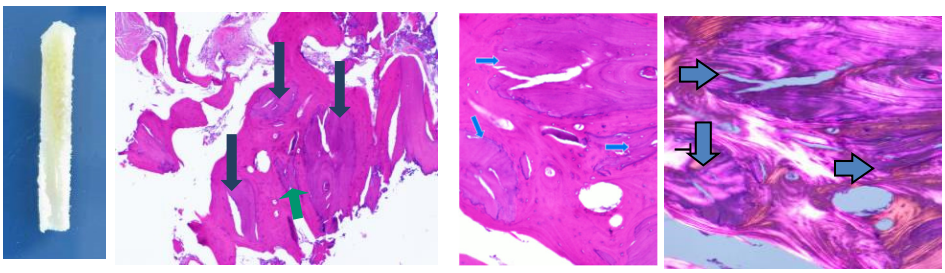
Histology and histomorphometric analysis as done on 12 subjects who underwent two-stage revision ACL reconstruction. In the first stage, the femoral and tibial tunnels were grafted with SCCO2 sterilized bone allograft. In the second stage, the revision ACL reconstruction was performed and bone biopsy specimens were taken.

RESULTS:

Twenty patients had core biopsies taken at the time of their second stage revision ACL procedure. Due to sampling inadequacies, poor biopsy quality or core sample fragmentation, eight biopsy specimens were not suitable for detailed histomorphometry and incorporation measurements. The remaining twelve patients all had uneventful stage 1 and 2 revision procedures.
The mean time between first and second stage procedure was 8.8 months (range, 5.6 to 21.3 months). The graft material was easily identified at the second stage procedure by its necrotic appearance with empty osteocytes lacunes within the trabecular bone. In all tissue samples predominately lamellar host bone apposition was seen on the surface of graft fragments known as creeping substitution. Separate bone graft fragments were bridged by newly formed woven bone. In 2 subjects, small islands of chondral cell differentiation were seen, indicating endochondral ossification. Active bone remodeling through combined osteoclastic and osteoblastic activity was present in 3 subjects, suggesting more advanced phases of graft incorporation. Mean bone volume was 68% over tissue volume (range 33-92%), and graft volume over bone volume was 41% (range 19-70%). Analysis of graft volume in relation to timing of second stage procedure could not demonstrate a difference in biopsies take <7 months (mean graft volume 44%, range 19-70 %) and biopsies take >10 months (mean graft volume 34%, range 19 -48%).

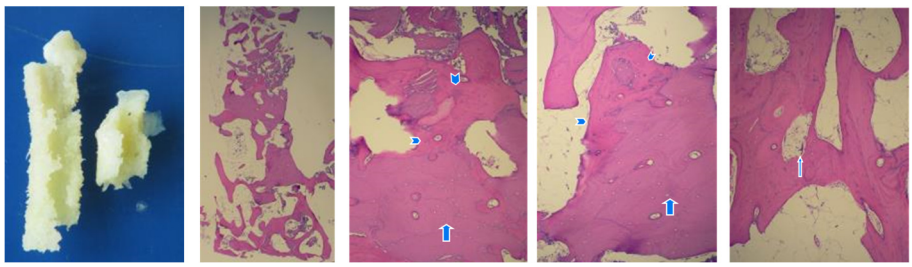
CONCLUSIONS

The osteoconductive SCCO2 sterilized bone allograft acted as an effective structural framework, allowing for successful graft incorporation through creeping subs titution. The initial bone apposition on and bridging of graft fragments provides early mechanical strengths to facilitate two -stage revision ACL reconstruction.



Sclerotic trabeculum with necrotic lamellar (arrows) bone bordered by lamellar and woven viable host bone

necrotic lamellar (arrows) bone bordered by lamellar viable host bone



Bone with sclerosis, low power

Sclerotic areas with necrotic paler compact lamellar (arrows) bone bordered by lamellar and woven viable host bone (arrowheads)

osteoblastic and osteoclastic remodelling (arrows)

15 Year Survival of Endoscopic ACL Reconstruction in Patients Aged 18 and Under

Matthew Morgan
Lucy Salmon
Alison Waller
Justin Roe
Leo Pinczewski

North Sydney Orthopaedic Research Group

Presented at:
* NSW Australian Orthopaedic Association 2014 Annual Scientific Meeting Friday 15 August 2014
* Australian Orthopaedic Association 2014 ASM, 12–16 October, Melbourne
* American Academy of Orthopaedic Surgeons Annual Meeting, 24-28 March 2015, Las Vegas, USA
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NORTH SYDNEY ORTHOPAEDIC & SPORTS MEDICINE CENTRE

INTRODUCTION

Within the young population, the literature examining the short term survival and the variables contributing to ACL injury after primary ACL reconstruction is limited. The long term evidence for the same is non-existent.

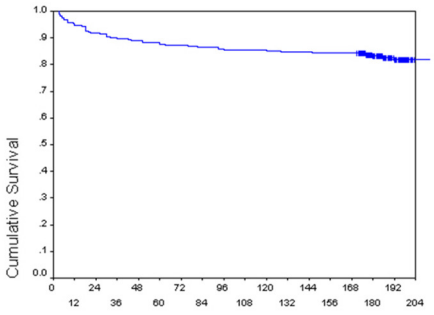
To determine the long term survival of the ACL graft and the CACL after primary reconstruction in those aged 18 years and under, and to identify the factors that increase the odds of subsequent ACL injury.

METHODS:

Patients having undergone primary ACL reconstruction at age 18 or less between 1993 and 1998, included in a prospective database by a single surgeon were considered. Single-incision endoscopic ACL reconstruction was performed with either autologous bone-patellar tendon-bone graft (BPTB) or hamstring tendon graft (HT). At a minimum of 15 years after ACL reconstruction patients completed a subjective questionnaire regarding current symptoms, further ACL injury, family history of ACL and level of activity.

RESULTS

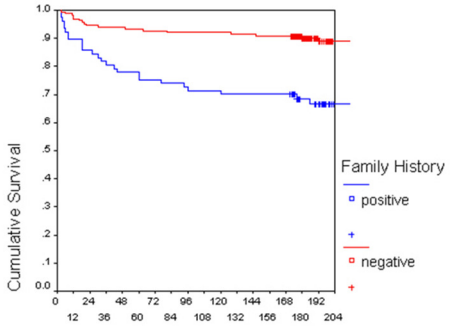
288 juveniles, aged 13-18 years, met the inclusion criteria of which 242 (84%) were reviewed at a mean of 16.5 years after ACL reconstruction. 75 (31%) patients sustained a further ACL injury of which 27 (11.2%) suffered an ACL graft rupture, 33 suffered a CACL injury (13.6%) and 15 sustained BOTH an ACL graft and a CACL rupture (6.2%) over 15 years.



A large proportion of ACL graft ruptures occurred within the first two years of ACL reconstruction, as illustrated by the slope of the survival curve in Figure 3. We found one third of the total number of ACL graft ruptures to occur within one year of primary reconstructive surgery, an incidence of 5%.

RESULTS

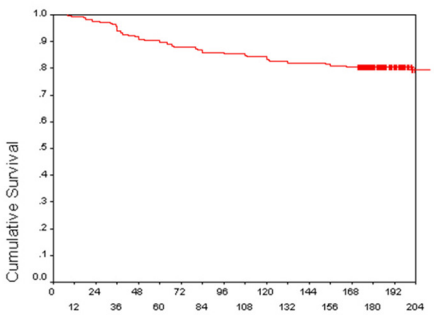
Survival of the ACL graft was 95%, 92%, 88%, 85% and 83% at 1, 2, 5, 10 and 15 years, respectively. Survival of the CACL was 99%, 98%, 90%, 83% and 81%, respectively. Survival of the ACL graft was less favourable in those with a positive family history (69% versus 90%, HR 3.6, p = .001). Survival of the CACL was less favourable in males than in females (75% versus 88%, HR 2.1, p = .03) and those that returned to competitive team ball sports (78% versus 89%, HR 2.3, p=0.05). Graft



ACL graft survival (months)

CONCLUSION

After a minimum of 15 years post primary ACL reconstruction, 69% of adolescents returned to their pre-injury level of activity, however, this was at a significant cost. Approximately one third of this population suffered a further ACL injury during the study period, with an incidence of 20% in the contralateral knee and 17% in the reconstructed knee. Further ACL injury in the adolescent cohort is relatively common with several factors being implicated in contributing to this increased risk.



Contralateral ACL Survivial (months)

Family history of ACL rupture significantly increased the hazard for ACL graft rupture and CACL injury was more common in males and those who return to team ball sports. High subjective scores and continued participation in sports were maintained over the long term after ACL reconstruction in the juvenile population.

Twenty Year outcome of a longitudinal prospective evaluation of isolated endoscopic ACL reconstruction with patella tendon autograft

Simon Thompson
Lucy Salmon
Alison Waller
James Linklater
Justin Roe
Leo Pinczewski

North Sydney Orthopaedic Research Group

Presented at:

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- ISAKOS Biennial Conference, 7-11 June 2015, Lyon, France

Awarded:

- John Joyce Award Winner, ISAKOS Congress, Lyon, France May 2015

Published:

NORTH SYDNEY ORTHOPAEDIC & SPORTS MEDICINE CENTRE

INTRODUCTION

Long term prospective follow up studies of single-incision endoscopic ACL reconstruction are limited and may include confounding factors. This longitudinal prospective study reports the outcome of isolated anterior cruciate ligament (ACL) reconstruction using middle-third patellar tendon autograft in 90 patients over 20 years.

METHODS:

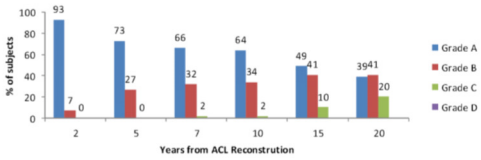
Between January 1993 and April 1994, 90 patients met study inclusion criteria, evaluation 1,2,3,4,5,7,10,15 and 20 years post surgery. Exclusion criteria: associated ligamentous injury requiring surgery, previous meniscectomy; meniscal injury meniscectomy more than 1/3; chondral injury; and an abnormal contralateral knee.

RESULTS:

At 20 years, 32(36%) patients had sustained another ACL injury, 8 (9%) to the index limb and 27(29%) to the contralateral limb (3 injuring both knees). Mean IKDC score was 86, 50% participated in strenuous/ very strenuous activities, kneeling pain was present in 63%. Radiographic degenerative change was found in 61%, 20% IKDC Grade C, 0% Grade D. IKDC clinical examination revealed 95% had a normal/nearly normal knee.

Significant gender differences existed: females were less likely to re-injure the reconstructed ACL (18%v2%, p=0.01), reported poorer IKDC subjective score (90v83, p=0.03), had more activity related pain (57%v20%, p=0.02),

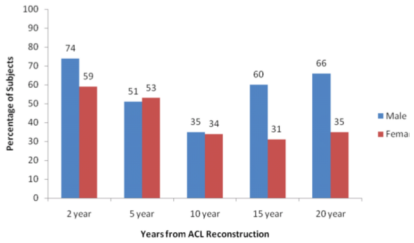
Figure 3: Overall IKDC Radiological Grading



RESULTS (CONT)

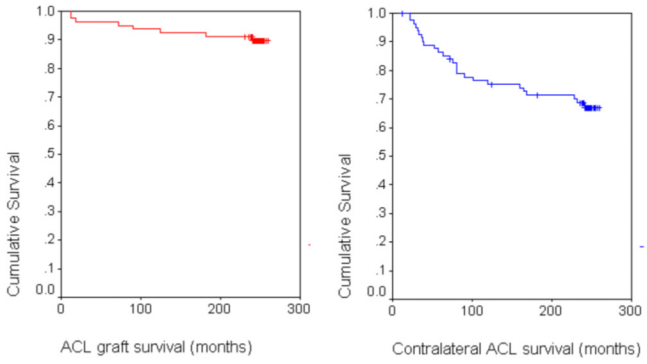
and less likely to participate in strenuous activity (35v66, p=0.01).

Figure 4: Percentage of males and females participating in strenuous sports at 2-20 years after reconstruction



ACL graft survival was not related to age. Patients <18years old had an increased odd ratio (3.2) for rupturing the contralateral ACL. Coronal graft angles <17 degrees had increased risk of failure compared to those over 17 degrees (96% v 77%), by a factor of 8.5.

Figure 6: Kaplan Meier ACL graft (left) And Contralateral ACL (right) survival over 20 years



CONCLUSION

Injury commonly occurred in the contralateral ACL than the reconstructed ACL graft, the most significant predictor of contralateral ACL injury is age under 18yrs. The most significant predictor of ACL graft rupture is a coronal graft angle of less than 27 17 degrees. Females had lower rerupture rates, poorer subjective scores, decreased participation in strenuous activity, putting the graft at less risk of failure. Kneeling pain remained persistent over 20 years. Radiographic osteoarthritis was evident in 61% of subjects but symptomatic osteoarthritic symptoms were rarely reported.

Construct Validity and Test Re-Test Reliability of the Forgotten Joint Score.

Simon Thompson FRCS

Justin Webb MBBS FRACS

Lucy Salmon PhD,

Alison Waller BAppSci,

Justin Roe MBBS, FRACS,

Presented at:

- ISOC, Mexico October 2014
- Australian Orthopaedic Association Annual Meeting, Sydney October 2012

Awarded:
Best Poster at APKASS Congress, 13-15 April, Nara Japan

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NORTH SYDNEY ORTHOPAEDIC & SPORTS MEDICINE CENTRE

INTRODUCTION

As patient outcomes following total knee replacement (TKR) have continued to improve and patient expectations have increased over recent years, traditionally used scoring tools have begun to demonstrate a ceiling effect, potentially losing the ability to determine differences in outcome in a high functional range. It has recently been suggested that the ultimate goal of arthroplasty surgery is for the patient to be able to forget their prosthetic joint during regular day to day activities. A new scoring system, The Forgotten Joint Score (FJS) has been developed. The FJS focuses on the patients' awareness of their joint replacement during a range of day to day and recreational activities. This score consists of 12 questions where subjects are asked to rate their awareness of their joint replacement during various activities. The aims of this study was to investigate the test retest reliability and the construct validity of the FJS-12 in English, specifically for patients who have undergone TKR.

METHODS:

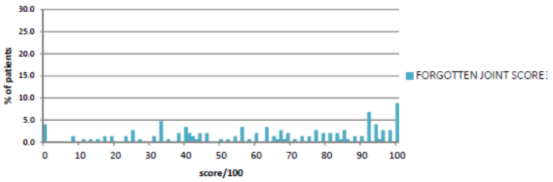
Patients undergoing TKR by the senior surgeon between 2006 and 2010 were invited to complete a questionnaire consisting of the FJS and the Knee Injury and Osteoarthritis Outcome Score (KOOS). The Western Ontario and McMaster Universities (WOMAC) osteoarthritis index scores were calculated from the KOOS score, and normalised in to a scale where high scores indicate a good outcome. WOMAC scores were normalised by summing the total score of each subscale and dividing by the maximum total score for the scale. Those who completed and returned their initial questionnaire were mailed a repeat questionnaire at 4 weeks.

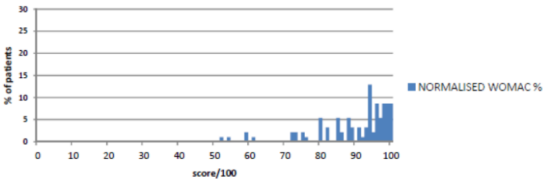
RESULTS

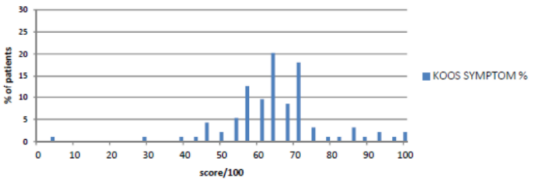
A total of 147 patients completed and returned both questionnaires and were included in the analysis.
There were 68 females and 79 males with a mean age of 67 years (range 32-89). The right knee was involved in 75 cases. A Triathalon (Stryker) prosthesis was used in 120 knees and a Genesis II (Smith & Nephew) prosthesis was used in 27 knees. The mean time from surgery to completion of the first questionnaire was 39 months (range 18-72).

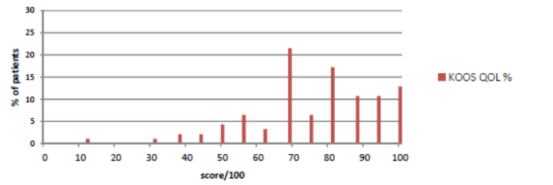
RESULTS

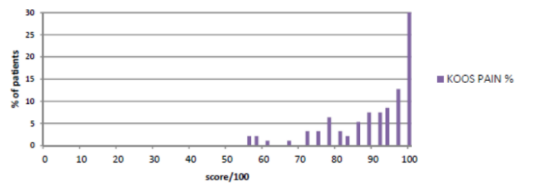
The FJS returned a mean score of 62 and 60 (range 0-100) and the normalised WOMAC overall mean score of 90 (range 52-100).
The test-retest reliability was almost perfect for the FJS (ICC=0.97, 95% confidence interval 0.95-0.98), and the FJS subdomains (ICC>0.8). Convergent construct validity of the FJS was correlated with Spearmans test to the KOOS Subscores of Quality of Life (0.63, p=0.001), Symptom (0.33, p=0.001), Pain (0.68, p=0.001) and ADL (0.66, p=0.001) and the Total WOMAC (0.70, p=0.001). The distribution of the FJS to the Normalised WOMAC and KOOS Subscales is shown in the Figures below.











CONCLUSION

The FJS demonstrates high test retest reliability and construct validity compared to the Normalised WOMAC and KOOS Subscales. The FJS does not demonstrate the ceiling effect of the WOMAC or KOOS pain scores so may have greater discriminatory ability following TKR.

Improvement in sleep quality and duration in Hip and Knee Arthroplasty subjects