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The graphic features a central 3D model of a hip joint, surrounded by hexagonal panels showing various scenes: a person at a computer, a stage presentation, and a group of people. The background is a mix of blue and white geometric shapes.

Abstract Book

(information correct at time of publication & subject to change without notice)

Category: General Arthroplasty

ID: 11539

Revision Septic Total Hip and Total Knee Arthroplasty Utilising the Lautenbach Method and Lautenbach Suction-instillation System

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Submission:

Background

A retrospective study was embarked upon to evaluate the outcome of the Lautenbach technique and the Lautenbach suction-instillation system in the eradication of infection within total hip and total knee arthroplasty patients

Introduction

Periprosthetic joint infections are a devastating complication of total joint arthroplasty. Various treatment modalities exist.

Method

Ethics approval was obtained. Between 2008 and 2019, 101 patients (n=46 total hip arthroplasty (THA) and n=55 total knee arthroplasty (TKA)) were identified, who met the criteria of a periprosthetic joint infection.

The study population included 52 male patients and 49 female patients, with a mean age of 66.4 years (65 years in the THA group and 67.8 years in the TKA group).

All patients underwent the Lautenbach method of treatment, which included the use of the Lautenbach suction-instillation system, performed by the same primary surgeon. Eradication of infection was assessed according to the MSIS criteria, with a minimum two year follow-up.

Results

An average of 2.9 different infective organisms were isolated from the total hip arthroplasty patients and an average of 2.16 organisms were isolated from the septic total knee arthroplasty patients. Multiple preceding revision surgeries had been performed in many cases; 16 two-stage and 4 single-stage re-revisions within the THA group and 2 two-stage and 2 single-stage re-revisions within the TKA group.

Infection was successfully eradicated in 45 out of 46 septic total hip arthroplasty patients (98%) and in 53 out of 55 septic total knee arthroplasty patients (96%). Altogether, 98 out of 101 patients (97%) remained free from infection.

Conclusion

These data support the use of the Lautenbach method and Lautenbach suction-instillation system in the management of septic total hip and total knee arthroplasties.

Category: General Arthroplasty

ID: 11545

Same-Calendar-Day Discharge Hip and Knee Arthroplasty can be Safely Achieved and Creates Value for Patients: The Proof Is In The Outcomes

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Submission:

Background

Same-calendar-day discharge arthroplasty (SCDDA) using a patient-centered approach has shown safety in hip and knee arthroplasty.

Introduction

This study aims to prove the viability of this process in South Africa by reporting the short/medium-term outcomes that matter to patients.

Method

A prospective study of over 300 arthroplasty patients. Patient cohort consisted of total hip (46%), total knee (33%) and unicompartmental knee (21%) arthroplasty patients across a multi-centered, multi-surgeon practice. Patients were deemed fit for SCDDA by a multidisciplinary team preoperatively. Patients were followed-up at 6 months and outcome scores were structured into the "Triple C" model: Capability, Comfort and Calm. Descriptive analyses and paired t-tests were performed. Statistical significance set at $p=0.05$ with 95% confidence intervals.

Results

Mean patient age was 62.77 ± 9.86 and BMI 30.29 ± 5.61 ; 44% male and 56% female. The 90-day medical and orthopaedic complication rate was 2.7% and 2.0%, respectively. Readmission rate was 1.6% for medical and 1.6% for orthopaedic. Capability of patients at 6-months was measured with HOOS-PS scores of 11.34 pre-operative to 0.96 ($p < 0.001$, 95%CI:8.95-11.55) and KOOS-PS scores from pre-operative 15.85 to 3.88 ($p < 0.001$, 95%CI:10.2-14.19). EQ-5D-5L scores showed improvement in patient mobility (3 vs 1; $p < 0.001$, 95%CI:1.50-1.85) and ability to perform activities (3 vs 1; $p < 0.001$, 95%CI:1.12-1.51). Expectations were met in 92% of patients. Comfort of patients was assessed using SANE scores, showing the affected joint scores increasing from 47.23 to 91.02 at 6-months ($p < 0.001$, |95%CI|:37.84-46.11). SANE scores show large discrepancy between affected and opposite joint pre-operatively (47.23 vs 82.2; $p < 0.001$, |95%CI|:31.73-38.22). Affected and opposite joints were comparable at 6-months (91.02 vs 88.18; $p=0.10$, 95%CI:-0.6 – 6.29).

EQ-5D-5L scores for pain and discomfort decreased (3 vs 1; $p < 0.001$, 95%CI: 1.61-1.99). Calm - patients were asked to rate their experience throughout their care cycle - overall calm score was 93%, and 94% of patients would do SCDDA again.

Conclusion

SCDDA demonstrates excellent clinical outcomes that matter to patients. SCDDA proves to be safe within the South African context when using a multidisciplinary team with a patient centered approach.

Category: General Arthroplasty

ID: 11546

The First 100 Same-Calendar-Day Discharge Hip and Knee Arthroplasty Patients At One Year Follow Up: The System Is Here To Stay

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Submission:

Background

Same-calendar-day discharge arthroplasty (SCDDA) has shown to be safe and effective with short to medium term follow-up.

Introduction

This paper aims to further validate the SCDDA pathway by reporting the one year outcomes of the first 100 patients of the same cohort.

Method

A prospective study of 100 SCDDA patients across a multi-centred, multi-surgeon practice. One year follow ups were completed telephonically or in person. Patient outcomes were collected under the Triple C Model: Capability, Comfort, Calm. Descriptive analyses and paired t-tests were performed. Significance set at $p=0.05$ with 95% confidence intervals (CI).

Results

Mean patient age 62.79 ± 7.62 years and BMI 30.30 ± 5.91 ; 41% male and 59% female. Capability of patients at 1 year follow-up was measured with HOOS-PS scores of 11.07 pre-operative to 0.86 ($p < 0.001$; 95%CI:7.94-12.92) and KOOS-PS scores from pre-operative 16.58 to 1.39 ($p < 0.001$; 95%CI:12.02-18.15). EQ-5D-5L scores showed improvement in patient mobility (3 vs 1; $p < 0.001$ 95%CI:1.39-2.03) and ability to perform activities (3 vs 1; $p < 0.001$ 95%CI:0.97-1.74). Expectations of 95% of patients were met. Comfort was demonstrated with SANE scores of the affected joint improving from 48.44 to 94.19 at 1 year ($p < 0.001$; |95%CI|:38.30-51.94). Pre-operatively patients showed a larger discrepancy in SANE scores between the affected joint compared to the opposite joint (48.44 vs 82.7; $p < 0.001$, |95%CI|:26.94-41.58), at 1 year patients reported the affected joint feeling better than the opposite joint (94.19 vs 86.74 ; $p=0.005$, 95%CI:2.38-12.52). EQ-VAS Pain scores improved at 1 year (3 vs 1; $p < 0.001$, 95%CI:1.59-2.22). Calm - demonstrated by 98% of patients being willing to do the SCDDA process again.

Conclusion

The one year outcomes of SCDDA patients show the longevity and reproducibility of the process. Patients show excellent clinical results and feel satisfied with their outcomes and functionality. The future of Same-Calendar-Day discharge arthroplasty in South Africa is bright and will add value to the care segment of hip and knee pathology.

Category: General Arthroplasty

ID: 11547

De-risking Arthroplasty – Understanding the Multidisciplinary Process with a Same-Calendar-Day Discharge Arthroplasty Model

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Submission:

Background

Arthroplasty is renowned for being a high-risk procedure.

Introduction

This paper aims to show that a comprehensive care pathway for arthroplasty patients with a multidisciplinary team (MDT) lowers the risk of complications and allows for better understanding of the needs of both the individual patient and patient group as a whole.

Method

A prospective study of over 300 arthroplasty patients across a multi-centred, multi-surgeon practice. All patients presenting with osteoarthritis were sent through a care pathway to assess risk and mitigate complications for Same-Calendar-Day Discharge Arthroplasty. Consults at the anaesthetic clinic would either deem patients fit for surgery or identify underlying conditions which were treated with the appropriate care cycle. Patients consulted with an MDT throughout the process and were followed up at 6 weeks, 6 months and 1-year post-operatively. Patient outcomes were collected and monitored as a whole – allowing the team to make changes to protocols based on patient results. Descriptive analysis of the data was performed.

Results

Patient age was 62.6 ± 9.1 and BMI 30.3 ± 5.6 . Patient RAPT scores: 64.3% scored low risk, 34.0% medium risk and 0.8% high risk. The 90-day complication rate was 2.7% medical and 2.0% orthopaedic with a 3.1% overall readmission rate. Average blood loss was 150ml and no patient required a transfusion. The number of patient comorbidities was initially approached conservatively (patients with one or two comorbidities would be accepted into the pathway), however, by understanding the individual patient after thorough assessment, we have been able to treat patients with up to six comorbidities by June 2021. Data collection flagged a high incidence of postoperative urinary retention (POUR) in males, once identified the team adjusted the protocols. Since adjusting protocols, POUR in our patient group has decreased in frequency. This was also achieved with orthostatic hypotension and post-operative nausea and vomiting.

Conclusion

By implementing the multidisciplinary care pathway and making decisions based on patient outcomes, we can understand patient risks and adapt to minimize them. We are confident in the processes applied in preparing patients for same-calendar-day discharge arthroplasty and both the team and patients have enjoyed the benefit thereof.

Category: General Arthroplasty

ID: 11551

The Quadruple Aim of Healthcare is Achieved Through a Multidisciplinary Same-Calendar-Day Discharge Arthroplasty Model

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Submission:

Background

Emphasis on cutting expenditure to the detriment of patient outcomes devalues healthcare and can worsen patient experience, increase complications and create negative provider experience. This ultimately leads to an increased population health burden and cost. The Quadruple Aim of Healthcare aims to counteract these chronic issues within the healthcare system by placing emphasis on improving patient experience, outcomes, affordability and provider experience.

Introduction

This study aims to evaluate the success of a multidisciplinary team approach to Same-Calendar-Day discharge arthroplasty (SCDDA) with respect to the Quadruple Aim of Healthcare.

Method

A retrospective review of a multidisciplinary team approach to SCDDA for hips and knees in terms of the Quadruple Aim of Healthcare. Patient cohort included 256 consecutive SCDDA from a multi-centre, multi-surgeon practice. SCDDA was measured against the Quadruple Aim of Healthcare: patient experience, better outcomes, cost reduction and provider experience. Data underwent descriptive statistics with paired t-tests. Statistical significance set at $p=0.05$ and reported with 95% confidence intervals (CI).

Results

Patient Experience: 92% of patients had their expectations met by 6 months post-operatively and 94% would go through the SCDDA care pathway again. **Better Outcomes:** Patients showed significant improvement from pre-operative scores at 6 months in HOOS-PS (11.34 vs 0.96; $p < 0.001$, 95%CI: 8.95-11.55) and KOOS-PS (15.85 vs 3.88; $p < 0.001$, 95%CI:10.2-14.19) scores. **Reducing Costs:** 91% of patients were safely discharged within the same-calendar-day of their procedures. Low complication rates of 2.7% medical and 2.0% orthopaedic directly reduces the financial health requirements of the funder population and increases affordability. An early return to work of 3 weeks lessens the financial burden on the community. **Provider Experience:** development of a multidisciplinary team creates a shared patient responsibility care model, which reduces strain on providers, increases free time and improves provider satisfaction.

Conclusion

Same-calendar-day arthroplasty through a multidisciplinary team approach is safe and desirable for patients and aligns with the Quadruple Aim of Healthcare. This approach enables South African orthopaedic surgeons to provide effective, affordable and safe hip and knee replacements to a large proportion of patients while achieving the Quadruple Aim of Healthcare.

Category: General Arthroplasty

ID: 11556

Same-Calendar-Day Discharge Hip and Knee Arthroplasty in an Ambulatory Surgical Centre: Efficiency is the Key

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Submission:

Background

Embracing Same-Calendar-Day Discharge Arthroplasty (SCDDA) in an Ambulatory Surgical Center (ASC) facility holds potential to optimize efficiencies and add value to patients.

Introduction

A comparison of SCDDA between an Acute hospital and an ASC, in terms of efficiency and safety.

Method

A prospective study to compare the efficiency and safety of SCDDA in ASC versus Acute facilities in South Africa. The sample consisted of 42 ASC and 133 Acute facility patients. All patients followed the SCDDA pathway and consulted the multidisciplinary team pre-operatively. The surgeon, anaesthetist and scrub sister team were consistent between the facilities. Standardized theatre and operating protocols were followed. Total theatre time defined from wheels-in to wheels-out of theatre. Descriptive statistics and t-tests were run. Significance set at $p=0.05$ with 95% confidence intervals (CI).

Results

Mean patient age was 61.2 ± 9.7 in ASC and 62.5 ± 9.1 in Acute ($p=0.44$; 95%CI:-4.7-2.07). Mean patient BMI was 30.1 ± 5.3 and 30.9 ± 5.8 for ASC and Acute, respectively ($p=0.36$; 95%CI:-2.8-1.03). ASC facilities hosted a 48% female sample versus 57% at Acute hospitals. Medical and orthopaedic complication rates in ASC were both 0.6%. Acute medical and orthopaedic complication rates were 2.3% and 1.7%, respectively. Total ASC theatre time was 105.9 ± 15.65 minutes compared to 110.37 ± 20.73 minutes in Acute ($p=0.14$; 95%CI:-10.45-1.52). ASC proves more efficient, with x-ray time accounted for within theatre time. Skin-to-skin time was quicker in ASC (59.26 ± 10.71 minutes) versus Acute (72.49 ± 17.31 minutes) ($p < 0.001$; |95%CI|:8.79-17.67), accredited to Acute theatres seeing more complex joints. On average a consecutive 3-case SCDDA list at an ASC would take 5 hours 25 minutes at average 1 hour 48 minutes per case, compared to list time of 6 hours 31 minutes at average 2 hours 10 minutes per case in Acute. Enhanced Recovery After Surgery (ERAS) conversion rate was 0% at ASC and 12% at Acute. Patient calm scores regarding the care pathway were 94% and 93% for ASC and Acute, respectively. 93% ASC and 96% Acute patients would happily go through the SCDDA process again.

Conclusion

The standardization of care using a consistent theatre team can replicate safe and efficient procedures while providing satisfactory patient experience for SCDDA in both ASC and Acute facilities.

Category: General Arthroplasty

ID: 11564

The impact of COVID–19 On Elective Arthroplasty at a Johannesburg Academic Hospital

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Submission:

Background

A high volume Arthroplasty centre has been defined as a unit performing more than a combined number of 400 hip and knee replacements per year. Institutions who fit these criteria have lower complication rates. Chris Hani Baragwaneth Academic Hospital as such is as a “High – Volume” centre.

Introduction

The COVID-19 pandemic severely curtailed the number of Arthroplasty cases being done from 2020 at our institution. Fear of transmission, complications and national legal framework all prohibited elective surgical procedures being done.

Method

We report the number of cases which have been done in our unit since the COVID-19 pandemic begun compared to the previously, indicating the steep cut off. We discuss implications of this and divide them into research, training and education as well as service delivery related. As patients were not following up in the clinics and reduced surgeries, research projects were postponed or cancelled and research could not be instituted. Hip and Knee Arthroplasty techniques are a requirement for registrar training as per the HPCSA. Registrar exposure and experience is severely curtailed with significant implications for our future Orthopaedic Surgeons. Patients are faced with delays in surgery further impacting their quality of life. Surgical dates cannot be confirmed and risk of litigation cannot be ignored. The anger and emotion patients express toward health care practitioners due to these delays and uncertainty leads to a somewhat tempestuous working environment.

Results

Since the onset of the COVID-19 pandemic, our institution has seen a dramatic decrease in Hip and Knee replacements being done. We can no longer define our unit as a "High - Volume" centre. This has led to poor teaching of registrars, fellows and students, poor service delivery, limited research and waiting list which are now the longest they have ever been.

Conclusion

The COVID-19 pandemic has taken its toll on elective surgery and the Hip and Knee arthroplasty division is not different. The implications of such are far reaching and methods to remedy the situation are desperately needed for research, teaching and service delivery to be put back on track.

Category: General Arthroplasty

ID: 11584

Debridement, Antibiotics, and Implant Retention (DAIR) Outcome in HIV Positive Patients

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Submission:

Background

The incidence of periprosthetic joint infection ranges from 2-4% for primary joint replacement and about 20% for revision surgery. There is an established role for DAIR in appropriately selected patients. Favourable outcome have been reported when diagnosis, proper treatment is instituted timeously.

Introduction

Periprosthetic joint infection (PJI) is a devastating complication following total joint replacement. Early publications on hip and knee arthroplasty in HIV positive patients reported high complications rates, but more recent publications demonstrate acceptable outcomes. Although DAIR has become a commonly performed procedure, there is paucity in the literature regarding the outcome of DAIR in HIV positive patients

Method

HIV positive patients who underwent DAIR procedures between 2016-2020 for hip and knee PJI were reviewed. Medical records were assessed for demographics, BMI, approach used, time from initial surgery to DAIR, infective markers, biochemical markers, Viral load, CD4 count, number of DAIR procedures, microbiology, and outcome.

Results

23 HIV positive patients underwent DAIR procedures, 15 females and 8 males. There were 17 hips and 6 knees, 82% patients were diagnosed with early post-operative PJI and 18% were late onset acute haematogenous spread. 9 (39%) patients underwent repeat DAIRs, 5 early post-operative and 4 haematogenous spread. There was 100% failure rate in the late onset group and 16% in the early onset group.

Conclusion

DAIR is a plausible procedure with reasonable success in early post-operative PJI patient with HIV. High CRP and late onset acute haematogenous PJI were associated with high failure rate

Category: Hip Arthroplasty

ID: 11496

Survivorship of Arthroscopic Hip Surgery for FAIS At 8-10 Years and Factors Predicting Reoperation

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Submission:

Background

Hip arthroscopy (HA) is now established for the treatment of non-arthroplasty hip pathology. Good to excellent outcomes have been noted in the majority of patients undergoing this procedure for femoroacetabular impingement syndrome (FAIS). Despite this, some will require revision HA or conversion to total hip arthroplasty (THA). Data on survivorship and risk factors for secondary surgery are limited.

Objectives

1. To determine survivorship of arthroscopic hip surgery for FAIS.
2. To determine whether age, social deprivation, specific preoperative radiographic signs and the type of procedure undertaken are predictive for HA failure.

Method

72 patients who had HA for FAIS between 2012 and 2013 were studied retrospectively. Electronic patient records and national radiology archives were used to obtain data. GP practices of patients from outside the region were contacted to confirm additional hip procedures. Follow-up ended November 2021 (minimum follow-up of 8 years). 42 surgeries were performed on the left hip (58.3%) and 44 patients were female (61.1%). 54 patients (75%) had labral repair at primary HA and 18 (25%) had labrectomy.

Results

4 patients had revision HA (5.6%). 8 patients had THA (11.1%). Survivorship for primary HA was 83.3% at a minimum of 8 years follow-up. Re-operated patients were older than primary only patients (mean age 38.7 years vs. 31.6 years). There was no difference in social deprivation rankings between the groups, with an average SIMD vigintile of 12.91 vs. 13.01. On preoperative radiographs of reoperated patients, the lateral centre-edge angle (LCEA) was on average 38.9°, and 5/12 patients (41.7%) had early radiographic signs of osteoarthritis (7 Tonnis Grade (TG) 0; 5 TG1). The primary only group had an average LCEA of 36.9° and 13/60 patients (21.7%) had early signs of osteoarthritis (47 TG0; 12 TG1; 1 TG2). 7/54 patients (13%) with labral repair had reoperation vs. 5/18 patients (27.8%) with labrectomy.

Conclusion

Survivorship at a minimum of 8 years was good. The re-operated group had a greater mean age, had a higher proportion of early radiographic changes of osteoarthritis and were more likely to have had a labrectomy as opposed to a labral repair as compared to those who didn't have another operation.

Category: Hip Arthroplasty

ID: 11499

Uncemented Cup with Cemented Stems Survival

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Submission:

Background

Retrospective outcome study of a single surgeon doing total hip arthroplasties with uncemented acetabulum and cemented stems for the past 7 years.

Objectives

PURPOSE OF STUDY

- To evaluate the survival rate of the uncemented cup
- To evaluate the survival rate of the cemented stem

The study material is taken from cases performed over the past seven years.

Method

I performed a retrospective, randomized study of 704 consecutive primary total hip replacements for the past 7 years from 2014 to 2021.

Two different uncemented cups and two different cemented stems were used.

The assessment was performed by phoning each patient and asking if they still have their primary hip replacement or was there any other surgery done to the hip over the past 7 years.

Results

According to the telephonic enquiries there were no acetabulum neither femoral stem revisions done.

Conclusion

The present study compared very well with the global and international outcomes of uncemented acetabula and cemented stems for total hip replacements.

This will also be an ongoing study.

Category: Hip Arthroplasty

ID: 11548

Total Hip Arthroplasty: It's About the System not the Approach

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Submission:

Background

Literature is brimming with controversy over the superior approach to Total Hip Arthroplasty (THA) in terms of safety and optimal outcomes. AMIS was popularised by industry for potential improvement of patient outcomes and achieving early mobilisation when compared to existing approaches.

Introduction

This paper aims to turn the limelight onto the system surrounding the approach, rather than the approach itself, to ensure favourable outcomes for THA patients.

Method

A sample of 118 THA patients operated by multiple surgeons using a posterior approach. Patients were sent through an extensive care pathway and consulted a multidisciplinary team pre- and post-operatively to assess and mitigate patient risk. All patients presenting with hip osteoarthritis underwent this standardized, repeatable process. The outcomes of patients having gone through this system were assessed. The pain management protocol is opioid-free. Descriptive statistics were run on the data. Paired t-tests were used to draw within-group comparisons with significance set at $p=0.05$ and 95% confidence intervals (CI).

Results

Average age was 62.07 ± 8.95 and average BMI was 29.57 ± 5.51 . Total theatre time was 114.05 ± 17.59 minutes. Average blood loss was 150ml with no patient requiring a transfusion. This cohort showed an average hospital length of stay was < 1 calendar day with only 9% of patients staying overnight. The average time to mobilisation was 3 hours 47 minutes with a pain score of 2.9 on mobilisation. Pain scores Day 1 post-operatively were at 5.41 which significantly improved to 2.38 by Day 7 ($p < 0.001$; 95%CI:2.50-3.94). HOOS-PS scores showed significant improvement from pre-operative (11.34) to 6 months post-operative (0.96) ($p < 0.001$; 95%CI:8.95-11.55). Patients were able to return to work, walk without crutches, drive and perform daily activities in under four weeks.

Conclusion

The posterior approach has shown to produce excellent patient outcomes; we believe it is the system developed around the patients rather than the approach that produces favourable outcomes. A preferred

approach should be learnt well and optimized by developing a care pathway to support and monitor patients throughout the arthroplasty process.

Category: Hip Arthroplasty

ID: 11554

Current Perspectives of South African Orthopaedic Surgeons to the Direct Anterior Approach In Total Hip Arthroplasty

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Submission:

Background

Despite the global increase in popularity for the use of the direct anterior approach (DAA) for total hip arthroplasty (THA), the current beliefs and reasons for its use and disuse amongst South African orthopaedic surgeons is not well understood.

Introduction

Despite the significant demand for THA and the huge numbers of THA performed worldwide, the optimal surgical approach to THA remains controversial. We, therefore, decided to investigate the current opinions and beliefs of South African Orthopaedic surgeons regarding the DAA

Method

We conducted an anonymous online survey sent to all current members of the South African Orthopedic Association to determine the perspectives regarding DAA compared to other surgical approaches to THA

Results

The response rate was 24.25% (n=194). There were 76 (39.18%) respondents that have performed DAA (DAA Performers) and 118 (60.82%) that have never performed DAA (DAA Non-performers). A proportion of 50% and 11.84% of DAA Performers were between 30 to 45 years and older than 60 years of age, respectively ($p < 0.000$). The DAA is the preferred approach to THA for 36.84% (n=28) of DAA performers, whilst 63.16% (n=48) prefer an alternative approach. Both DAA Performers who prefer DAA and those who prefer alternative approaches consider DAA more satisfactory for length of hospital stay ($p < 0.000$) and short term functional outcomes ($p=0.002$) compared to other surgical approaches. For DAA Non-performers, the primary reasons for not performing DAA THA was inexperience in surgical technique (72.09%), increased operative time (12.79%), unsatisfactory outcomes (27.91%) and learning curve (67.44%). There were 5 (18.52%) and 30 (70.33%) surgeons who have been in clinical practice for more than 10 years that do and do not intend to use DAA in the future, respectively ($p < 0.000$).

Conclusion

The trends of the adoption of the DAA by South African orthopaedic surgeons show increasing popularity, similar to patterns seen in the United Kingdom and the United States of America. Younger surgeons are more likely to perform the DAA THA whilst more experienced surgeons are less likely to deviate from their current

standard of practice.

Category: Hip Arthroplasty

ID: 11555

The Aetiology of Patients Presenting for Elective Total Hip Arthroplasty (THA) in South Africa - A Retrospective Review of 1400 Consecutive Patients

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Submission:

Background

Currently there are 450 patients per 100 000 population presenting to a primary care facility with hip pain each year. Globally there are 1 million THA's performed annually with the average cost of \$40 000, placing a massive financial burden on healthcare systems

Introduction

Several factors contribute ultimately to patient outcomes and complications of which preoperative diagnosis is one. Therefore, the aim of our paper was to describe the various aetiologies of hip pathologies in patients presenting for primary elective THA

Method

We retrospectively reviewed 1,400 patients presenting for elective primary THA to a tertiary South African academic hospital between January 2016 and December 2019. Ethical approval was granted by the ethics review board of the University of the Witwatersrand. Clinical notes and radiological x-rays were evaluated by a senior orthopaedic consultant and medical officer. Basic demographic data was correlated with clinical notes, examination findings, and radiological records

Results

There were 2176 pathological hips planned for elective THA. Bilateral pathology was present in 776 (56%) patients of which 92% had the same pathology. There were 427 (31%) Males and 937 (69%) females with an average patient age of 58.80 ± 14.13 years and average BMI of 28.01 ± 5.13 . The incidence of primary osteoarthritis (1OA) was 638 (29%), Secondary OA 198 (9%) and 289 (13%) with femoroacetabular impingement (FAI). Almost 1 in 5, (24%) of patients presented for avascular necrosis (AVN). The primary reasons for AVN included: HIV (50%), trauma (42%) and alcohol (28%). Patients presenting with AVN were statistically significantly younger ($p < 0.003$) and had a lower BMI ($p < 0.002$) in comparison to patients presenting for other pathologies.

Conclusion

The aetiology of patients presenting for elective THA in South Africa differs significantly from those in developed countries. 1 in 5 patients presented with AVN of the hip of which the majority are HIV related.

Patients presenting with end stage HIV related hip pathology are statistically younger than patients presenting with other hip pathologies. We believe measures need to be implemented in future on trying to earlier identify AVN in HIV positive patients to alleviate the burden of disease in the South African context.

Category: Hip Arthroplasty

ID: 11557

A Clinical Review of Patients who Underwent Arthroplasty for the Treatment of a Neck of Femur Fracture at an Academic Hospital

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Submission:

Background

Intracapsular neck of femur fractures are common in the elderly and are associated with significant morbidity and mortality. Little is known about the outcome of intracapsular neck of femur fractures in South Africa. The aim of this study was to determine the outcome of patients who underwent arthroplasty for the treatment of a neck of femur fracture at an academic hospital.

Methods

A retrospective, descriptive review was done on 114 patients who underwent arthroplasty for the treatment of a neck of femur fracture at an academic hospital. Primary outcome measures included mortality and morbidity. Secondary outcome measures included patient based outcome scores, as well as clinician based outcome measures.

Results

The mean age of the patients was 66.6 years (range 50 to 92 years). The majority of patients were female (n = 65; 59.1%). Most patients underwent an uncemented total hip arthroplasty (n = 80; 72.7%). The posterior approach was the most frequently used approach (n = 74; 67.3%). There was one (0.9%) in-hospital mortality and 19 (17.3%) patients had morbidities. Iatrogenic intra-operative peri-prosthetic fracture was the most frequently encountered complication, occurring in 14 (12.7%) patients. This did not alter the outcome.

Conclusion

Our results show that patients have a favourable outcome when arthroplasty is used for the treatment of neck of femur fractures even though our management protocol differs from the recommended guidelines.

Furthermore, our results indicate a low rate of morbidity with only one mortality.

Category: Hip Arthroplasty

ID: 11562

Total Hip Arthroplasty for Neck of Femur Fractures Secondary to Civilian Gunshot Injuries

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Submission:

Background

The optimal treatment for displaced, high energy intracapsular neck of femur fractures in young adult patients remains a challenge. They are associated with a high failure rate due to avascular necrosis and non-union. Civilian gunshot injuries to the hip joint further compound the issue due to the consistent comminution imparted by the projectile energy.

The literature on total hip arthroplasty for civilian gunshot injuries remains sparse. Available studies are limited to case reports, small series and military conflict with blast injuries or high energy assault weapons.

Introduction

We aimed to report on a series of patients who underwent total hip arthroplasty (THR) for civilian gunshot hip injuries to the femoral neck and head. The objectives are to identify associated injuries and their management as well as complications and risk factors of this injury pattern.

Method

A retrospective case series report on civilian gunshot wounds was from December 2010 to December 2020 was conducted of this relatively rare injury. All patients who had undergone THR at our institution were included. Mechanism of injury, fracture location, presence of associated injuries, fixation and reconstruction techniques, progression to union (in the late arthroplasty group) and complications were analysed.

Results

A total 71 patients with gunshot wounds to the hip were admitted over the study period. Eight of these patients underwent early or late THR. Delayed arthroplasty was carried out for non-union or failure of fixation in four patients. Median follow-up of five months (0-30 months). All patients were operated on by the senior author using a modification of the anterolateral approach. Three had associated injuries including one rectal injury and two bladder injuries. Of the four that underwent delayed THR the mean time from fixation to arthroplasty was median of 12.5 months (9-120 months).

Conclusion

In this relatively small series, we have shown that total hip arthroplasty is a safe and feasible option for these

injuries with limited fixation or reconstruction options. Due to the complexity of the fracture patterns, early arthroplasty should be considered to reduce to risk of complications and improved early return to function.

Category: Hip Arthroplasty

ID: 11572

The Anterolateral Approach is not dead

Author: Marc Nortje

Author Institute: PGWC

Submission:

Background

In hip arthroplasty there has always been lively debate about which approach is best. The direct anterior approach has risen in popularity and many surgeons still strongly defend the posterior approach, but the anterolateral or Hardinge approach is still used by some surgeons and may offer a particular advantage over the other two approaches.

Introduction

The prevalence of gluteus medius or minimus (hip abductor) muscle tears in older individuals ranges from 10-20% (1,2). The anterolateral approach often reveals an occult tear of Gluteus minimus that would not be evident with other approaches, and it is easy to repair. The aim is to describe the anterolateral approach, document the status of the abductors, describe the repair and assess early post op function.

Method

We randomly chose patients undergoing total hip replacement surgery and photographed the surgical approach and closure and took a video of the patient mobilising two weeks post operatively.

Results

We show patients with differing degrees of tears to the abductor muscles, describe the approach and ability to repair the abductors. Post-operative videos taken at two week showing their gait demonstrates good outcomes.

Conclusion

The anterolateral approach for total hip arthroplasty remains a safe, successful surgical approach and it provides good access for assessment and repair of abductor muscle tears.

Category: Hip Arthroplasty

ID: 11573

Validation of a Post-operative Radiographic Scoring Tool in Hip Arthroplasty

Author : Marc Nortje

Author Institute : PGWC

Submission:

Background

Surgeons perform preoperative templating in order to plan the restoration of patient anatomy with hip arthroplasty. We want to develop a tool that gives a radiographic score to post-operative implant positioning and leg lengths based on what was planned.

Introduction

To assess the inter and intra observer variability of digital radiographic templating performed a total hip replacement.

Method

We asked 2 experienced hip surgeons to retrospectively template the same 20 hip X-rays and then analysed the size and position of the templated implants.

The observers were allocated a score for each of these variables according to how closely the template resembled the post op X-ray.

In the second part of the study we asked 3 junior and 3 senior registrars to template three pre op xrays without seeing the post op xray or knowing the implant sizes. The registrars were given the same instructions, the junior registrars had not been through the formal arthroplasty rotation and the seniors had and therefore had some experience with templating. The 3 post op xrays were chosen from relatively straight forward primary hip arthroplasty cases that had been performed by the consultant and were regarded as the 'gold standard' as the post op xray closely matched the pre op plan and scored maximum points.

Results

Between the two experts, Leg-Length correction was the most similar.

Highest variation was observed for the Center of Rotation between the experts.

Ultimately the variations between experts were not found to be statistically significant and they both scored highly ($p > 0.05$).

Senior Registrars achieved significantly higher scores than the Junior Registrars ($p < 0.05$).

Conclusion

We have developed a scoring tool that is based on a preoperative template and a postoperative radiograph and appears from a pilot to be a valid test of surgical planning experience.

We plan to perform a prospective longitudinal study in the future to assess the development of trainees in our institution.

Category: Hip Arthroplasty

ID: 11575

Comparison between Intraoperative Predicted and Post-operative Radiographic Acetabular Inclination Angle

Author: Marc Nortje

Author Institute: PGWC

Submission:

Background

Generally the acetabular component in total hip arthroplasty is planned to be placed in 45 degrees of inclination unless there is abnormal anatomy.

Introduction

The current study aims to determine the accuracy of intraoperative predicted acetabular inclination angles among different levels of surgeon's experience and across different hospitals in South Africa.

Method

A cross-sectional study was done across 9 different hospitals in 4 provinces in South Africa on 89 patients between May 2018 and December 2018 for 10 weeks and the surgery was performed by surgeons with different levels of experience. Intraoperative and post-operative acetabular inclination angles were obtained. The measurements were statistically compared using a Shapiro-Wilk test in IBM SPSS. The cut-off for statistical significance was set at $p < 0.05$.

Results

The average intraoperative predicted angle for experienced surgeons was 41 degrees and the average post-operative angle was 39 degrees. The average intraoperative predicted angles for less experienced surgeons was 41 degrees and the average post-operative angles were 42 degrees.

The average intraoperative predicted angles for tertiary hospitals was 37.6 degrees and the average post-operative angle was 42 degrees, the average intraoperative predicted angles for secondary hospitals were 44 degrees and average postoperative angles were 43 degrees.

Conclusion

From this study, we found that there was no significant difference ($p > 0.05$) among the different hospitals and different levels of surgeon experience when comparing the accuracy of predicted inclination angles.

Category: Hip Arthroplasty

ID: 11580

Ceramic-on-ceramic Resurfacing

Author: Chris Frey

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Submission:

Background

Hip resurfacing is an elegant, bone preserving form of total hip arthroplasty when used in the correct patient population. Previously, this was performed using metal-on-metal resurfacing components that, in some cases, resulted in devastating complications.

Introduction

The advent of ceramic-on-ceramic resurfacing components has provided a sound alternative for many patients today.

Method

Twenty seven ceramic-on-ceramic hip resurfacing were performed by the same primary surgeon with a follow-up of 2.4 years. The mean age was 52 years, the female to male ratio was 19 to 8. Three participants had bilateral resurfacing done. The main admission diagnosis was degenerative osteoarthritic changes followed by changes from developmental hip dysplasia and slipped capital femoral epiphysis. Ethical approval was obtained.

Results

n=27 patients underwent a standardised post-operative mobilisation program. All patients had routine control X-rays. There have not been any major or minor complications recorded in the immediate, delayed and late post-op periods.

Conclusion

Ceramic-on-ceramic components in hip resurfacing provides a sound alternative in hip resurfacing to the patient without the devastating metal ion complications.

Category: Hip Arthroplasty

ID: 11585

Short-term Outcomes of One-stage Bilateral Total Hip Arthroplasty in a South African Central Hospital

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Submission:

Background

Background: Total hip arthroplasty (THA) is one of the most successful orthopaedic surgical procedures that dramatically improve function, pain relief, and quality of life for the patient. In South Africa, we have a high prevalence of osteonecrosis of the femoral head (ONFH) and inflammatory arthropathy affecting a young population. This subgroup of patients are usually between the age of 30-50 years (young) and require bilateral total hip replacements (BTHA) to allow them to return to their previous level of function and employment.

Introduction

The study aimed to assess the short-term outcomes and complications in patients with bilateral hip pathology managed surgically with a one-stage BTHA.

Method

Methods:

We retrospectively reviewed a series of 33 patients who underwent a one-stage BTHA at a specialised arthroplasty unit in a central hospital in South Africa between January 2016 and December 2018. The mean age was 38 years (Standard Deviation [SD] +/- 8.6), and the most common diagnosis was ONFH (75.8%). In this cohort, 12 patients (36.4%) tested HIV positive. We assessed patient folders for diagnosis, perioperative details, postoperative follow-up and complications. Radiographic analysis was also performed.

Results

Results: There were no revisions or planned surgical intervention for all patients at a median follow-up of 22 months (interquartile range [IQR] 11–45 months). Thirty patients reported no hip pain, and walked unaided at their most recent follow-up visit. Two patients reported groin pain and continued to walk with a single crutch. One patient demised from unrelated causes approximately one-year post-surgery. One patient developed a urinary tract infection (UTI) post-operatively which resolved with intravenous antibiotic therapy. The median post-operative length of stay was six days (IQR 4-7 days) and no other medical or surgical complications were reported. Radiographic analysis revealed four patients (12.1%) with Brooker grade 1 heterotopic ossification in six hips.

Conclusion

Our results suggest that surgical treatment with a one-stage BTHA is a good alternative to a two-stage BTHA when performed in a high volume arthroplasty centre and carefully selected patients. The 30-day mortality rate was 0%, and the complication rate was low.

Category: Knee Arthroplasty

ID: 11484

Outliers in Bone Balanced Total Knee Arthroplasties (TKA) Do Not Fail and Maintain High Patient Satisfaction at 8 To 13yr Follow Ups

Author : Ponky Firer

Author Institute: Self

Co-author: Ciaran McGarvey

Co -Author Institute: Basingstoke Knee Clinic UK

Submission:

Background

Bone Balanced knees, where bone cuts are adjusted to get balance within 2 degrees, thus avoiding soft tissue releases, was devised in order to improve the poor (80-85%) patient satisfaction reported with mechanically aligned TKAs. A significant improvement to 93% patient satisfaction has been shown by this technique and the alignment profile of this group was similar to the normal constitutional alignment published in the literature. Fourteen percent of this group of 864 TKAs were found to be outliers (HKA > +/- 3 degrees).

Objectives

This study assessed if this group of HKA outliers or any patient with a tibial or femoral component in > +/- 3 degrees from mechanical neutrality had an increased failure rate or loss of satisfaction at mid-term follow up. (Mean 10.5yrs)

Method

161 knees with either an HKA; tibial component or femoral component that were outliers were compared with a mechanically aligned cohort, matched by age, sex, BMI. Patients were questioned about satisfaction or changes in satisfaction from their original follow up; and if they had or were anticipating any further surgery on their knee.

Results

One hundred and fifteen (71.4%) of the outlier group responded and were matched to a group of aligned TKAs. Of those lost to follow up 3 had died; 4 had emigrated and the remainder could not be contacted. One hundred and seven (93.0%) were very satisfied or satisfied. Of the dissatisfied 8, one is awaiting revision for tibial plate posterior collapse. The other 7 are dissatisfied because of ongoing pain. This compares with the matched group of aligned knees in which 92.7% were very satisfied or satisfied. Two knees have been revised for aseptic loosening. The reason for dissatisfaction in the aligned group was pain and/ or stiffness. There was no statistical difference between the two groups.

Conclusion

So called "outliers" in TKAs that have been balanced by bone cuts and have constitutional alignment have a 99.1% survivorship at midterm (10.5yr) follow up. Patient satisfaction in this group remains very high and matches a group that were neutrally aligned.

Category: Knee Arthroplasty

ID: 11486

Does a Medial Pivot Knee Prosthesis Improve Clinical Results

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Submission:

Background

It is reported that 20% to 30% of patients are displeased after a total knee replacement (TKR). In theory, the newer medial pivot designs should improve the kinematics of the knee and improve the clinical results. I outcomes in TKA.

Objectives

To our knowledge, there is no study that proves that the more modern anatomical designs do in fact improve functional

A randomized control clinical trial was done to compare the functional results of a conventional fixed bearing CR prosthesis with that of two modern anatomic fixed bearing CR designs

Method

A randomized control clinical trial (RCT) was conducted comparing three different prosthetic designs. The prostheses consisted of the U2, a conventional fixed-bearing cruciate-retaining (CR) prosthesis, and two fixed-bearing medial pivot CR prostheses, Journey II and Persona MC.

A computer program was used for randomization. Surgery was performed by a single surgeon using a comparable protocol.

To evaluate the clinical outcomes, KOOS and UCLA scores were captured preoperatively and again at 6 and 12 months postoperative. At 12 months, in addition, the Forgotten Joint Score was added.

174 of patients that underwent a TKR from July 2018 to January 2019 participated in the study. There were no statistical differences in patient demographics and preoperative KOOS and UCLA scores

Results

The measured outcomes improved significantly from preoperative to 6 months follow-up for all implants. From 6 to 12 months, there were further significant improvements for all implants, except for the life quality KOOS sub score of the Journey II.

At 12 months follow up the total ($p = 0.049$), symptoms ($p = 0.03$), and life-quality ($p = 0.02$) scores of KOOS were significantly higher for U2 than Journey II but the mean differences were still less than the MCID. There was no significant difference between U2 and Persona and between Persona and Journey for KOOS, UCLA activity score, and Forgotten Joint Score.

Conclusion

This study showed that the clinical outcomes of a conventional CR prosthesis are comparable or even better than that of modern medial pivot CR designs. This suggests that other factors than knee kinematics play a role in patient satisfaction

Category: Knee Arthroplasty

ID: 11487

Bone Balancing the Results and Surgical Technique for Restricted Kinematic Aligned Knee Replacement

Author : Pieter (Spike) Erasmus

Author Institute : Self

Submission:

Background

There is a tendency of moving away from neutral mechanical alignment towards more kinematically aligned prosthesis to improve the clinical results of knee replacements

Objectives

To evaluate the clinical results of a surgical technique called, bone balancing, aiming to have a restricted kinematic aligned limb

Method

We developed a unique manual instrumentation that is not prosthesis specific. The tibial cut is made first and depending on the patient's constitutional alignment the coronal cut is made at 3° varus to 2° valgus. The sagittal cut follows the patient's natural tibial slope. In extension, the knee is balanced, from the tibial cut with spacers and the distal femoral cut done. If the difference between the medial and lateral spacers is more than 3 mm a conservative ligament release is done before rebalancing. The femoral sagittal cut is 90° to the anterior femoral cortex. No intramedullary instrumentation is used.

174 consecutive total knee replacements were done and followed up for 12 months. In 31% a conservative ligament release was done, mostly of the posterior capsule. In 47% a patella resurfacing was performed. Preoperatively a KOOS and UCLA activity score was done and then repeated at 12 months when a forgotten joint score was added to the scores

Results

There was a statistically significant improvement in all the scores at 12 months. The total KOOS score improved from 43 to 85 the sub-scores for symptoms from 53 to 91, pain from 50 to 95, function from 48 to 93, sport from 15 to 35, and quality of life from 25 to 81. The UCLA activity from 3.8 to 5.4. The forgotten joint score was 85

Conclusion

We attained satisfactory results for our technique. Both the Koos and forgotten joint scores are slightly higher than the scores, using different techniques including robotic assisted TKR reported in the literature

Category: Knee Arthroplasty

ID: 11492

TKR's For Dummies

Author : Ponky Firer

Submission:

Background

Techniques for Total Knee Replacement have evolved primarily based on the (mis)conception that neutral mechanical alignment for all is best. Positioning of components is based on anatomic references some of which are not possible to accurately determine. Based on this a femur first approach is often used and any imbalances of soft tissues requires surgical trauma to mostly normal soft tissues, euphemistically called soft tissue releases.

The literature has repeatedly shown that despite technological advances (computer navigation and robotics) this approach leaves around 80% dissatisfied patients (largely because of residual pain) and an unacceptably high early revision rate for instability.

A more logical approach to TKR is required that will be applicable to the vast majority of cases.

Objectives

To describe a logical stepwise approach to making the bone cuts that will allow for the variations in patients anatomy, and variations in sizes of components available. To present the mid term outcomes of this approach.

Method

The tibia cut affects both the flexion and extension gaps equally and thus must be carried out first. The flexion gap size created is dependent on the available A-P sizes of prosthesis and hence should be established next. The femoral rotation should be based on balanced soft tissues and not anatomical landmarks. the extension gap is created to match the size of the flexion gap and at a valgus angle that gives soft tissue balance

Results

Between 2007 and 2012 918 TKR were prospectively followed using the "Bone balancing" technique described above.

9-14 yr follow up of 80% of these patients showed a satisfaction rate of 92.8% and a mechanical failure rate of less than 1% irrespective of alignment achieved. Long leg X-rays showed constitutional alignment of this group.

Conclusion

A logical simple technique (Bone Balancing) can assure natural alignment and high patient satisfaction with low failure rates in TKRs in which soft tissue releases are not required.

Category: Knee Arthroplasty

ID: 11560

Correlation of the Squat-and-Smile Test against Other Patient Reported Outcome Scores In Knee Pathology

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Submission:

Background

Patient Reported Outcome Measures (PROM) are crucial to determine functional deficits and monitor clinical improvement as well as scientific outcome, but PROMs can be time consuming, score differently across diverse socio-economic classes, and language barriers may lead to an incorrectly reported outcome. The need exists for a PROM in knee pathology that is quick to administer and universal across socio-economic and cultural classes.

Introduction

The use of Patient Reported Outcome Measures (PROM) for knee pathology may be affected by socioeconomic factors, language barriers and time constraints in busy outpatient clinics. The Squat and Smile Test (SST) is an example of such a test that has previously been validated for femur fractures. The aim of this study was to validate the SST against other PROM in patients with knee pathology.

Method

Patients presenting to a subspecialist knee clinic in a large hospital in sub-Saharan Africa were approached to participate. They were asked to squat and the depth of the squat as well as the need to support themselves were classified into 4 categories. To describe their pain, participants also selected one of three smiley faces (unhappy, neutral, smiling). These test scores were correlated to the patient's Knee Injury and Osteoarthritis Outcome Score (KOOS), Lysholm Tegner Score and EQ5D scores.

Results

Seventy patients (median age 53.4 years) were included. The Squat depth correlated moderately with the KOOS score ($r = 0.56$) and poorly with the EQ5D and Lysholm scores ($r=0.46$; $r= 0.43$). The need for squat support had poor correlations with the KOOS, EQ5D and Lysholm scores ($r= 0.29$; $r=0.31$; $r=0.31$) as did the Smiley Face component ($r=0.40$; $r=0.32$; $r=0.30$).

Conclusion

For patients with knee pathology, the squat depth correlates moderately with other PROM. It could therefore be used in settings for which conventional PROM have limited application. Support needed to squat, and a visual analogue scale of smiley faces had poor correlation when compared to other knee PROM and should not be used for the assessment of knee pathology.

Category: Knee Arthroplasty

ID: 11563

Robotic-arm Assisted Total Knee Arthroplasty is Associated with Improved Accuracy and Patient Reported Outcomes: A Systematic Review and Meta-analysis

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Submission:

Background

Robotic assisted surgery offers the potential to improve the accuracy of implantation of the prosthesis and with potentially improved functional outcomes

Introduction

1) the learning curve of robotic-arm assisted total knee arthroplasty (rTKA) and to compare (2) the accuracy of component positioning, (3) alignment and balancing techniques, (4) patient reported functional outcomes, and (5) complications between rTKA and manual total knee arthroplasty (mTKA)

Method

Searches of PubMed, Medline and Google Scholar were performed in October 2020 in line with the Preferred Reporting Items for Systematic Review and Meta-Analysis statement. Search terms included “robotic”, “knee” and “arthroplasty”. The inclusion criteria were published clinical research articles reporting the learning curve for rTKA (robotic-arm assisted only) and those comparing the implantation accuracy, alignment and balancing techniques, functional outcomes or complications with mTKA

Results

16 studies satisfied the inclusion criteria and reported the learning curve for rTKA (n=5), component positioning accuracy (n=6), alignment and balancing techniques (n=7), functional outcomes (n=7), or complications (n=5). Two studies reported the learning curve using CUSUM analysis to establish an inflexion point for proficiency which ranged from 7 to 11 cases and there was no learning curve for component positioning accuracy. The meta-analysis showed a significantly lower difference between planned component position and implanted component position, and the spread narrower as compared with the mTKA group (Femur coronal: mean 1.31, 95% confidence interval (CI) 1.08 to 1.55, $p < 0.00001$; Tibia coronal: mean 1.56, 95%CI 1.32 to 1.81, $p < 0.00001$). Three studies reported using different and two reported using the same alignment and balancing techniques between the mTKA and rTKA groups, and two studies did not state the methods used in their rTKA groups. rTKA resulted in better Knee Society Score compared to mTKA in the short-to-mid-term follow up (95%CI [-1.23, -0.51], $P=0.004$). There was no difference in arthrofibrosis, superficial and deep infection, wound dehiscence, or overall complication rates.

Conclusion

rTKA was associated with improved accuracy of component positioning and early knee specific functional outcomes. Future studies should report on the knee alignment and balancing techniques utilised in rTKAs so that greater comparisons could be made on which techniques are associated with the benefits of rTKAs.

Category: Knee Arthroplasty

ID: 11571

Does Robotic Arthroplasty Cost More and Take Longer Than Conventional Total Knee Arthroplasty

Author : Werner van der Merwe

Author Institute : Self

Submission:

Background

Robotic total knee arthroplasty has gained in popularity with new more user friendly robotic assisted systems. Robotic arm assisted (RAA) total knee arthroplasty has been shown to improve surgical accuracy, shorten hospital stay and decrease postoperative morbidity. Additional cost and added operative time has been cited as unwanted effects of robotic surgery. The South African health care system is already under financial pressure and treatment has to remain cost effective.

Introduction

The South African health care system is already under financial pressure and treatment has to remain cost effective.

Studies have shown that robotic assistance can increase cost of supplies by 2,26 times and in the UK this has been estimated to be between 750 and 3 500 pounds.

Method

The preceding 74 total knee arthroplasty cases done by a single surgeon without robotic assistance is compared to the first 126 cases done with robotic assistance. Average time in theater was measured in minutes. Cost per event was compared between groups and broken down into ethicals, surgicals, prosthesis cost and equipment cost. Data was obtained from hospital records.

Results

Cost per event showed an increase in cost of about R 6 000 per case for robotic assistance. Surprisingly the average theatre time for a robotic case was less than for the conventional technique. (106 vs 114 min) Both these findings were statistically significant.

Conclusion

Additional cost with robotic arm assisted total knee arthroplasty was less than previously reported and robotic assistance can save theater time.

Category: Knee Arthroplasty

ID: 11574

The Learning Curve of Robotic Assisted Total Knee Arthroplasty

Author : Werner van der Merwe

Author Institute : Self

Submission:

Background

Total knee arthroplasty is an extremely successful procedure in terms of prosthetic survival but lags behind total hip arthroplasty when it comes to patient satisfaction. Technology can play an important role in improving outcomes.

Introduction

In an endeavour to custom fit the prosthetic knee to the individual patient, the importance of alternative alignment philosophies and fine tuning prosthetic position to match the bone morphology has been highlighted. Robotic assistance would seem to be an obvious means to achieve this but past experience has taught us that adopting new technology has a significant learning curve.

Method

The first 126 robotic arm assisted total knee arthroplasty cases by a single surgeon is presented as a retrospective case study. The learning curve is assessed in terms of theatre time as well as patient outcome. For theatre time the group was subdivided into groups of 25 each. Visual analogue pain scores and Oxford knee scores were obtained pre operatively and at 6 week follow up as well as at 6 month follow up.

Results

Theatre time initially increased after the first 25 cases to a maximum of 112 minutes for the group of 50 to 75 patients. There after it decreased consistently to the current theatre time of 98 minutes for the last group of 25 patients. This is contrary to previous reports in literature showing a constant decrease in operative time after the first 15 to 40 cases. The improvement in operative time was thus non linear and followed an asymmetric bell curve.

Vas scores for pain improved significantly as well as Oxford knee scores. The average Oxford knee score at 6 months was 44. Also of importance was the small variance in Oxford scores with no outliers performing poorly.

Conclusion

The learning curve in terms of operative time decreased after 75 cases. Patient outcomes were not affected by the learning curve.

Category: Knee Arthroplasty

ID: 11579

Patella Resurfacing Does Not Offer a Clinical Significant Advantage when a Modern Patella Friendly Total Knee Arthroplasty is Employed: A Systematic Review and Meta-analysis

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Submission:

Background

Modern total knee arthroplasty (TKA) femoral components are designed to provide a more optimal articular surface for the patella whether or not it has been resurfaced. Previous systematic reviews comparing outcomes of patella resurfacing and no resurfacing combine both historic and modern designs

Introduction

Total knee arthroplasty (TKA) is a commonly performed cost-effective procedure that improves function [1] and relieves pain in end-stage degenerative joint disease. During the procedure the patella can either be; resurfaced with a polyethylene patella implant (patella resurfacing; PR) or left un-resurfaced with or without patelloplasty and/or denervation (non-patella resurfacing; NPR). The decision to resurface the patellar remains a divisive topic with multiple randomised controlled trials (RCTs) and meta-analyses reporting mixed evidence regarding effectiveness

Method

MEDline, PubMed and google scholar studies were evaluated using SIGN assessment tool and data analysis was conducted on only randomised controlled trials (RCTs).

Results

Thirty-two RCT were identified of which 11 used “patella friendly” and 21 “patella non-friendly” implants. “Patella friendly” TKAs were associated with no differences in anterior knee pain rates between resurfaced and un-resurfaced groups. Patella resurfacing with “patella friendly” implants had significantly higher clinical (mean difference (MD) -0.77, $p=0.007$,) and functional (MD -1.87, $p < 0.0001$,) knee society scores (KSS) than un-resurfaced counterparts but these did not exceed the minimal clinically important difference. Resurfacing with “patella friendly” implants was not associated with a significant ($p=0.59$) difference in the Oxford knee score (OKS), in contrast when a “patella non-friendly” implant was used there was a significant difference (MD 3.3, $p=0.005$) in favour of resurfacing.

There was an increased risk of reoperation for unresurfaced TKAs with “non-patella friendly” implants (OR 1.68, 95% CI 1.03 to 2.74, $p=0.04$), but not for unresurfaced patellae with “patella friendly” implants (OR 1.17, CI 0.59 to 2.30).

Conclusion

Patella resurfacing in combination with a modern patella-friendly implant did not offer a lower rate of anterior knee pain, complications, or reoperations compared to not resurfacing, nor did it give a clinically significant improvement in knee specific function.

Category: Knee Arthroplasty

ID: 11581

One-Dose of Tranexamic Acid Reduces Blood Loss and Transfusion Rates in Patients Undergoing Simultaneous Bilateral Total Knee Arthroplasty

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Submission:

Background

As an inexpensive antifibrinolytic agent, Tranexamic acid (TXA) is routinely used in elective total knee arthroplasty (TKA) due to its proven safety and effectiveness in decreasing blood loss and transfusion rates.

Introduction

Simultaneous bilateral TKA has been related to an increased risk of perioperative blood loss and consequent transfusions. However, a universal consensus promoting the use of TXA in patients undergoing simultaneous bilateral TKA is still lacking. This study sought to analyse the effectiveness of a single intravenous dose of TXA on perioperative blood loss, transfusion rates and identify the risk factors in patients undergoing simultaneous bilateral TKA.

Method

We conducted a single-centre, retrospective, observational study, including all 125 patients (mean age 62 years; mean BMI (kg/m²) 32; 67 (53.6%) females) who had undergone elective simultaneous bilateral TKA with a single intravenous dose of 20 mg/kg of TXA immediately before skin incision between April 2008 and August 2019. Patient demographics, surgical characteristics, in-hospital stay, transfusion rates, haematological parameters, and associated complications were recorded. A multivariate logistic regression model was performed to identify independent risk factors for blood transfusion

Results

The transfusion rate after simultaneous bilateral TKA was only 4% (5/125). Mean preoperative Haemoglobin level was 141.7 g/L (113 to 170), and mean values on postoperative day 1 and at discharge were 108.8 g/L (85 to 148) and 99.4 g/L (72 to 160), respectively. Three patients suffered a pulmonary embolism, which were treated with oral anticoagulants. After performing the multivariate logistic regression, an increased surgical time (adjusted odds ratio [aOR] = 1.101; 95% Confidence interval [CI] = 1.021-1.187; p=0.012) and an older age (aOR = 1.241; 95% [CI] = 1.018 to 1.511; p=0.032) were found to be significant risk factor for blood transfusion.

Conclusion

A single intravenous dose of 20 mg/kg of TXA led to a low transfusion rate (4.0%) and higher haemoglobin levels at discharge without increasing the risk of venous thromboembolism events after simultaneous bilateral

TKA. Risk factors for transfusion must be individualised in each patient before considering a universal transfusion risk assessment.

Category: Knee Arthroplasty

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Instability in Cruciate Retaining Total Knee Arthroplasty: A Hybrid Computational-experimental Joint Motion Simulation Study

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Background

Flexion and mid-flexion instability are used to describe instability in a flexed implanted knee.

Introduction

During activities of daily living (ADL), the knee is maintained in a flexed position potentiating the possible instability. Therefore, we investigated the contribution towards the instability of under- and or overstuffing the tibiofemoral joint space with the polyethylene (PE) insert.

Method

This study employed a hybrid computational-experimental joint motion simulation on a 6 degrees of freedom joint motion simulator. Physical prototypes of a virtually performed TKA in mechanical alignment based on cadaveric CT scans and a virtual ligament model were utilised. The reference, understuffed (downsized 2 mm) and overstuffing (upsized 2 mm) joint spaces were simulated, and ADL loads and motions were performed for each configuration.

Results

We identified regions in the resultant kinematic waveforms results where the under- and overstuffing configurations deviated from the reference configuration. During gait in the sagittal kinematics during the stance phase (10-35% gait cycle), there was an increased mean translation in the understuffed configuration - 5.8 mm \pm 0.6 and decreased mean translation in the overstuffing configuration -4.3 mm \pm 1.1 compared to the reference configuration -5.2 mm \pm 0.8. During this period, the knee was flexed between 13-22°. During the swing phase, there was rotation instability observed in the understuffed configuration. This is demonstrated by the peak in the understuffed waveform as the knee was extending from 61 to 10 degrees of flexion. This observation is unlikely due to the understuffed joint space but can be attributed to lack of secondary stabilizers in our model. The knee flexion range was 13-33°. The mean axial rotations 0-50% were -5.1° \pm 3.1, -7.3° \pm 3.1 and -9.0° \pm 2.7 in the understuffed, reference and overstuffing configurations, respectively.

Conclusion

In implant modularity, changes in the PE insert sizing affect the TKA kinematics and soft tissue laxity during ADL. This hybrid biomechanical study highlights that understuffing the joint with a 2 mm smaller PE insert in isolation is unlikely to create instability with flexion during ADL.