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ORIGINAL ARTICLE

FOLLOW UP OF 15 YEARS OF THE PATIENTS WITH TOTAL KNEE REPLACEMENT: A CASE CONTROL STUDY

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ABSTRACT:
Introduction: Following total knee replacement (TKR) some patients continue to have pain or develop a new pain which may be accompanied by other symptoms such as instability, stiffness or swelling. There is often significant delay in establishing the cause of persistent pain after TKR. There appears to be no studies comparing the progress of young patients following TKR for osteoarthritis of the knee compared to a control group of matched older patients. The aim of this study was to compare the outcome from total knee replacement (TKR) in young versus old patients in terms of pain and function. **Material & Methods:** All patients undergoing TKR in our institution since 2005, have been followed up at regular intervals. From the database patients undergoing TKR who were under the age of 55 years at the primary procedure, regardless of diagnosis were selected. The patients had not reached at least 15 years follow-up were excluded.. Once these had been selected, a second control group was selected from the same data- base of patients, selecting patients who were over the age of 55yrs at the time of primary procedure, again regard- less of diagnosis. The groups were matched for ASA, body mass index and underlying diagnosis. **Results & Conclusions:** The greatest difference is seen in the function scores with the young group scoring 75.9 at 15 years and the older group scoring 50.5 ($p < 0.05$). It would appear that the younger patients achieve and maintain a higher function after TKA. A decline is seen between 10 and fifteen years that is reflected in the older group also. Both groups are seen to decline at 15 years post arthroplasty but the reasons for this are not clear.
Keywords: TKA, Functional Outcome, Follow up period.

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INTRODUCTION

If your knee is severely damaged by arthritis or injury, it may be hard for you to perform simple activities, such as walking or climbing stairs. You may even begin to feel pain while you are sitting or lying down.

If nonsurgical treatments like medications and using walking supports are no longer helpful, you may want to consider total knee replacement surgery. Joint replacement surgery is a safe and effective procedure to relieve pain, correct leg deformity, and help you resume normal activities.[1]

Knee replacement surgery was first performed in 1968. Since then, improvements in surgical materials and techniques have greatly increased its effectiveness. Total knee replacements are one of the most successful procedures in all of medicine. According to the Agency for Healthcare Research and Quality, more than 600,000 knee replacements are performed each year in the United States.[2]

Total knee replacement (TKR) surgery is the gold standard method in the treatment of end stage knee arthritis with a high success. Relieving pain effectively, restoring range of motion and improving function are the major goals of arthroplasy. Patient satisfaction rates were reported as 90% to 95% after TKR.[3]

Although total knee replacement (TKR) is an effective operation for end-stage arthritis of the knee, many patients have persistent symptoms after this procedure. The evaluation of painful TKR includes a quadruple assessment involving clinical

evaluation, serological investigation, diagnostic imaging and microbiological analysis in order to identify the underlying aetiology.[4] However, occasionally there is no obvious underlying cause to account for the pain. In such a situation, after a thorough assessment of the painful joint, a plan of management should be made and agreed upon with the patient. It is also important to involve a pain specialist early, specifically for the prevention of a chronic pain syndrome.[4]

Following total knee replacement (TKR) some patients continue to have pain or develop a new pain which may be accompanied by other symptoms such as instability, stiffness or swelling. There is often significant delay in establishing the cause of persistent pain after TKR.[5]

There appears to be no studies comparing the progress of young patients following TKR for osteoarthritis of the knee compared to a control group of matched older patients. The aim of this study was to compare the outcome from total knee replacement (TKR) in young versus old patients in terms of pain and function.

MATERIAL & METHODS

All patients undergoing TKR in our institution since 2005, have been followed up at regular intervals. From the database patients undergoing TKR who were under the age of 55 years at the primary procedure, regardless of diagnosis were selected. The patients had not reached at least 15 years follow-up were excluded.. Once these had been selected, a second control group was selected from the same data- base of patients, selecting patients who were over the age of 55yrs at the time of primary procedure, again regard- less of diagnosis. The groups were matched for ASA, body mass index and underlying diagnosis.

All patients in the series had demographic and clinical outcome data collected prospectively on admission and at follow up clinics run by a specialist arthroplasty nurse at 10 days pre-operatively and 6 months, 18 months, 3 years, 5 years and 8-10 years post-surgery. The operations were performed in a filtered air operating theatre with laminar flow. Waterproof single use gowns and drapes were used and surgeon and assistant were double gloved. A tourniquet was used routinely.

RESULTS:

Thirty patients who were 60 years or younger at the time of primary TKR were taken into account and 50 knees were taken in to account. Time frame had allowed 15 years or more follow up. Of all the 30 patients 5 of them died before final follow up and further 10 were lost to follow up, at the end 40 knees had data at the end of 15 years. These were matched with older patients from the database with 15 year follow up. The groups were matched for BMI, ASA and diagno- sis. 10 knees could not be matched and were excluded. This left a study group of 30 young and 30 older knees.

Average Length of stay was higher for the older group 15 days compared to the younger group 10 days. This trend continued in both unilateral and bilateral patient groups, with bilateral replacements patients stayed an average of 10 days in the young group compared with 12 in the older group in contrast to 7 and 11 days in the unilateral knee replacement group. Pain scores ($p = 0.015$) and American Knee Society "Knee" ($p < 0.001$) and "Function" ($p < 0.001$) scores changed significantly over time. There were however no statistical differences over the 15 year period in pain ($p = 0.398$) and knee performance (0.713) but overall function was higher throughout the period in the younger group ($p = 0.003$). The greatest difference is seen in the function scores with the young group scoring 75.9 at 15 years and the older group scoring 50.5 ($p < 0.05$). It would appear that the younger patients achieve and maintain a higher function after TKA. A decline is seen between 10 and fifteen years that is reflected in the older group also. Both groups are seen to decline at 15 years post arthroplasty but the reasons for this are not clear. There is no increase in the revision rate for either group at this time. The decline may reflect a change in the activity profile of patients in both groups who are, by definition, 10 years older.

The function scores are better for the younger knees and remain so for longer. This difference may be due to the general decline in mobility with advancing years. For example the patient who uses a stick will lose points.

DISCUSSION

The aim of the present study was to compare functional out- comes for young patients undergoing TKA with older patients. The population at risk is likely to remain fit and active for longer and many are keen to maintain an active lifestyle despite joint disease. As a result younger patients are presenting to orthopaedics services requesting joint replacement.[6]

The outcomes of total knee arthroplasty (TKA) can be assessed with various methods; implant survivorship, image-based assessment, clinical assessment and patient-reported outcome measures (PROMs).[7, 8] While the first three modalities are objective in nature, patient report can provide a subjective measure of the patients' perception of the success of an intervention.[8]

The importance of including patients' views on treatment outcome in orthopaedics has been well established in recent years and a variety of patient-reported measures are available. Furthermore self-reported questionnaires are a potentially cost-effective way of monitoring patient outcome in large volumes.[9]

The survival analysis of cohort showed that women and younger patients were statistically more likely to survive to 15 years following TKR. The mortality rates at both three months and one year post-operatively, are comparable to contemporary results for England and Wales.[10]

The best-case survival curve at 15 years following TKR showed that 92.7% of prostheses were still in situ. In the worst-case survival, 81.1% were in situ. However, our best case scenario findings differed from those of the Swedish Knee Arthroplasty register with respect to the influence of gender, with 89.5% of prostheses surviving to 15 years in males and 93.5% in females.[10]

Patient satisfaction is the ultimate goal of all orthopaedic procedures. However, total joint arthroplasty is performed in the face of degeneration of the normal articulation, often at the conclusion of a protracted, painful, and ultimately unsuccessful campaign to preserve the natural joint.[11]

Against this backdrop, satisfaction with the outcome of this final stage of treatment may be defined in many different ways, with widely varying results.[11] Previous studies have demonstrated that, to an important extent, the expectations and perceptions of individual patients may define whether the outcome of knee replacement is successful, whether some degree of residual deficit is disabling, and whether, at some point in the future, symptoms related to knee function will cause the patient to seek additional treatment.[11, 12]

Patient satisfaction is becoming increasingly important in defining a successful outcome of surgical intervention. This statement is particularly true of total knee replacement which is performed on an elective basis to restore joint function and eliminate disabling pain.[13] Surgeons are critically aware of variations in the functional outcome of knee replacement, and differences between patients in terms of their satisfaction with the procedure, however, the relationship between outcome and patient satisfaction is clearly multifactorial. Moreover, the relative impact of each factor on patients' evaluation of their functional status remains to be elucidated.[14]

A systematic review reported Implant survivorship between 90.6% and 99% during the first decade and be- tween 85% and 96.5% during the second decade of follow-up. Mean American Knee Society clinical and functional scores increased by 47 and 37 points. Ranawat et al report on a cohort of younger patients, Most of who suffered from rheumatoid arthritis. They highlight a radiographic lucency in 30% but it is unclear the clinical significance of this as they report a ten year survival of 96%.[6]

CONCLUSION:

Patients aged less than 55 years undergoing TKA can achieve similar outcomes at 15 years post procedure in terms of pain and function compared with older patients. This information is useful in counseling and consenting patients prior to surgery. Careful patient selection remains critical in achieving these outcomes. We suggest that TKA should not be withheld in patients under 55 years of age purely on grounds of age alone.

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