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Better Rehabilitation and More Satisfaction in Immediate Post-Operative Period in Patients of Robotic TKR As Compared to Conventional TKR

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ABSTRACT

Total knee replacement (TKR) is highly effective for pain relief and restoration of joint function in arthritic knees, providing satisfactory results in over 90% of patients. Efforts to improve clinical and radiological outcomes have spurred technological advances, such as computer navigation, patient-specific cutting guides, and semicustom patient-specific implants. Robotic TKR has gained popularity among orthopaedic surgeons in the operative suite because of its accuracy and precision of component placement. Patient satisfaction after TKA can be associated with patients' expectations, pain relief, and functional improvement. Scoring systems like the knee society score and patient reported outcome measures can be used to assess the outcome which directly co relates with patient satisfaction.In this study knee society score, and a PROM (Patient reported outcome measures) of three sets of questions were used. This study showed robotic TKR provides a better rehabilitation and high satisfaction rate in patients in immediate post-operative period. So patients may be counselled accordingly if they want easy and better rehabilitation in immediate post-operative period.

Keywords*: learning, curve, robotic, total, knee, replacement. rehabilitation, satisfaction C.O.I: The authors declare no conflict of interest.*

INTRODUCTION

Total knee arthroplasty (TKR) is highly effective for pain relief and restoration of joint function in arthritic knees, providing satisfactory results in over 90% of patients[1,2,3]. Studies have shown that well-balanced knees with good alignment are an important precondition for successful TKR and prolonged implant survival.[4,5,6,7] Efforts to improve clinical and radiological outcomes have spurred technological advances, such as computer navigation, patient-specific cutting guides, and semicustom patient-specific implants. Robotic TKR has gained popularity among orthopaedic surgeons in the operative suite because of its accuracy and precision of component placement.(8) Prospective studies comparing robotic TKR to conventional TKR have revealed that robotic TKR is more accurate with less variation in the mechanical axis in spite of no difference in clinical outcomes compared to conventional TKR.(9,10) The robotic approach facilitates accurate procedure without any changes in the preoperative plan, surgical exposure and reaming process are supervised by the surgeon using the computer-controlled cutting system(11).

MATERIALS AND METHODS:

The preesnt study was conducted on 150 patients (150 knees) who underwent TKR. Follow up period was two months. It was a double blinded comparative study to assess and compare the rehabilitation and patient satisfaction rate in early post op period b/w robotic and conventional TKR. Inclusion criteria was , patient suffering from advanced and painful knee arhroses with mechanical axis of knee between 20 degree of varus and 10 degree of valgus , at least 90 degree ROM at

knee .No previous surgery on knee no , no instability, age below 70 years,. Exclusion criteria was post traumatic arthritis knee, post septic knee, B.M.I above 40, any instability in knee, history of any previous surgery on knee. All patients fulfilling inclusion criteria were allocated under two groups , robotic and conventional group. Robotic group underwent robotic total knee replacement (Figure 1) and conventional group underwent conventional total knee replacement. Allocation within these two groups was random without any selection bias.

FIG: Burring of bone in robotic TKR

All patients received same knee implant and were operated by one surgeon. Surgical approach was medial parapatellar approach. Patient's demographic data were recorded pre operatively, knee society score and patient administered questionnaire were calculated at follow up of 2 months. Present study was a prospective cohort study.

Post operatively: The patients were allowed partial weight bearing form the same post operative day. This was achieved this by femoral nerve adductor canal sensory block. Passive ROM exercises , active ankle and toe mobilisation and calf pumps, high sitting were allowed. Findings were recorded as knee society scores at two months follow up.

RESULTS:

At 2 months of follow up with 75 patients in robotic group with mean age of 66 +/- 0.4 years, the mean knee society score was 76 +/- 4.15 , where as in conventional TKR group, at 2 moths follow up with 75 patient with mean age group 66+/-0.2 years , the mean knee society score was 69+/-4.76 ($P< 0.001$). Knee society function score in robotic cohort was 86, whereas knee society function score in conventional cohort was 77 ($P< 0.001$). 92% patients in robotic TKR group were very satisfied with the surgery where as in conventional TKR group 85% patients were very satisfied with the surgery done.

DISCUSSION:

The concept of patient satisfaction was first defined by Ware et al.(12) in 1873. Patient satisfaction after TKR can be associated with patients' expectations, pain relief, and functional improvement. Lau et al.(13)suggested that following two perspectives, internal determinants and external components, should be considered in the evaluation of patient satisfaction. The former refers to patient-dependent factors, such as age and expectations, whereas the latter indicates patient-independent factors, such as hospital environment and surgical technique.

The Knee Society Clinical Rating System has been widely used since 1989 as a relatively objective scoring system for the assessment of TKR outcomes in spite of deficiencies in the items for patient satisfaction assessment. The new Knee Society Knee Scoring System was introduced in 2011 to incorporate patient-reported outcome assessment scales (satisfaction, expectations, and physical activities) in the rating system(14) . WOMAC score can also be used for patient satisfaction after total knee replacement (15). EQ-5D-3L score is also used for early assessment of patient perception of outcome in total knee replacement(16). Other popular PROMs include the 36-item Short Form Health Survey (SF-36)(17). We used the knee society score ,and a PROM of three sets of questions: (1) How much are you satisfied with your surgery ? very satisfied or satisfied or not satisfied. (2) Did this arthroplasty increase our functional capacity ? (3) Did this arthroplasty decrease your pain ?

The most common causes of patient dissatisfaction include residual pain and limited function; however, pain relief and functional recovery have demonstrated no significant correlation in many studies(18). The possible internal determinants of patient satisfaction include age, gender, patient's personality, patient's expectations, physical and psychological co morbidities, diagnosis for TKR, and the severity of arthropathy(18).

External components that can be associated with patient satisfaction include anaesthesia, postoperative pain management, surgical technique, implant type, and postoperative rehabilitation, body mass index, previous history of knee surgery and disabilities(18).

CONCLUSION:

Robotic TKR provides a better rehabilitation and high satisfaction rate in patients in immediate post operative period. But studies have shown no difference in final outcome.

Conflict of interest: The author report no conflict of interest concerning the material used in this study or the findings specified in this paper.

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